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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RTID 0648-XC058

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Site Characterization Surveys off New Jersey and New York in the area of the Atlantic Shores Lease Area (OCS-A 0541)

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible renewal.

SUMMARY: NMFS has received a request from Atlantic Shores Offshore Wind Bight, LLC (Atlantic Shores Bight) for authorization to take marine mammals incidental to site characterization surveys off New Jersey and New York in the area of Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf Lease Area (OCS-A 0541). Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-time, one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorization and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than [*insert date 30 days after date of publication in the FEDERAL REGISTER*].

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service and should be submitted via email to *ITP.taylor@noaa.gov*.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments, including all attachments, must not exceed a 25-megabyte file size. All comments received are a part of the public record and will generally be posted online at *www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act* without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Jessica Taylor, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable*. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are proposed or, if the taking is

limited to harassment, a notice of a proposed incidental harassment authorization is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

Summary of Request

On April 8, 2022, NMFS received a request from Atlantic Shores Bight for an IHA to take marine mammals incidental to marine site characterization survey activities off New Jersey and New York. The application was deemed adequate and complete on May 23, 2022. Atlantic Shores Bight's request is for take of 15 species of marine mammals by Level B harassment only. Neither Atlantic Shores Bight nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued three IHAs to Atlantic Shores, the parent company of Atlantic Shores Bight, for similar work in a comparable geographic region (85 FR 21198, April 16, 2020; 86 FR 21289, April 22, 2021; 87 FR 24103, April 20, 2022). The 2020 monitoring report confirmed that Atlantic Shores had previously implemented the required mitigation and monitoring, and demonstrated that no impacts of a scale or nature not previously analyzed or authorized had occurred as a result of the activities conducted under the 2020 IHA. At the time of developing this proposed IHA for Atlantic Shores Bight, the Atlantic Shores 2021 (Renewal) monitoring report was not available as the renewal IHA expired on April 19, 2022 (86 FR 21289; April 22, 2021).

Description of Proposed Activity

Overview

As part of its overall marine site characterization survey operations, Atlantic Shores Bight proposes to conduct high-resolution geophysical (HRG) surveys in the Lease Area (OCS)-A 0451 and along potential submarine export cable routes (ECR) to a landfall location in either New York or New Jersey. These two areas are collectively referred to as the survey area. The survey area is approximately 1,375,710 acres (5,567.3

km^2) and extends from 11 nautical miles (20 km) offshore of New Jersey and New York out to a maximum distance of approximately 40 nautical miles (74 km).

The purpose of the proposed surveys are to support the site characterization, siting, and engineering design of offshore wind project facilities including wind turbine generators, offshore substations, and submarine cables within the Lease Area and along ECRs. A maximum of three survey vessels may operate at any one time during the proposed surveys. Underwater sound resulting from Atlantic Shores Bight's proposed site characterization survey activities, specifically HRG surveys, has the potential to result in incidental take of marine mammals in the form of behavioral harassment. Atlantic Shores Bight intends to conduct HRG surveys within the lease area and ECR survey areas over a period of up to 12 months.

Dates and Duration

Survey activities are proposed to initiate on August 1, 2022. The estimated duration of the in-water activities is expected to be up to 360 total survey days over the course of a single year within the two survey areas (Table 1). As multiple vessels (*i.e.,* a maximum of three survey vessels) may be operating at any one time across the Lease Area and ECR Survey Area, each day that a survey vessel is operating counts as a single survey day. For example, if three vessels are operating in the ECR and Lease Areas concurrently, this counts as three survey days. This schedule is based on 24-hours of operations throughout 12 months. The schedule presented here for this proposed project has accounted for potential down time due to inclement weather or other project-related delays.

Table 1. Number of survey days for proposed HRG activities

Survey areas	Number of active survey days expected
Lease Survey Area (OCS-A 541)	180

ECR Survey Area	180
Total: 360 days	

Specific Geographic Region

Atlantic Shores Bight's proposed activities would occur in the Northwest Atlantic Ocean within Federal and state waters (Figure 1). Surveys would occur in the Lease Area and along potential ECRs to landfall in either New York or New Jersey. Proposed activities would occur within the Commercial Lease of Submerged Lands for Renewable Energy Development Lease Area OCS-A 0541. The survey area is approximately 1,375,710 acres (5,567.3 square kilometers (km^2)) and extends from 11 nautical miles (20 kilometers (km)) offshore to approximately 40 nautical miles (nm; 74 kilometers (km)) offshore. In general, the survey area spans from Sandy Hook Bay to Ocean City, New Jersey. No nearshore surveys are proposed for this project.

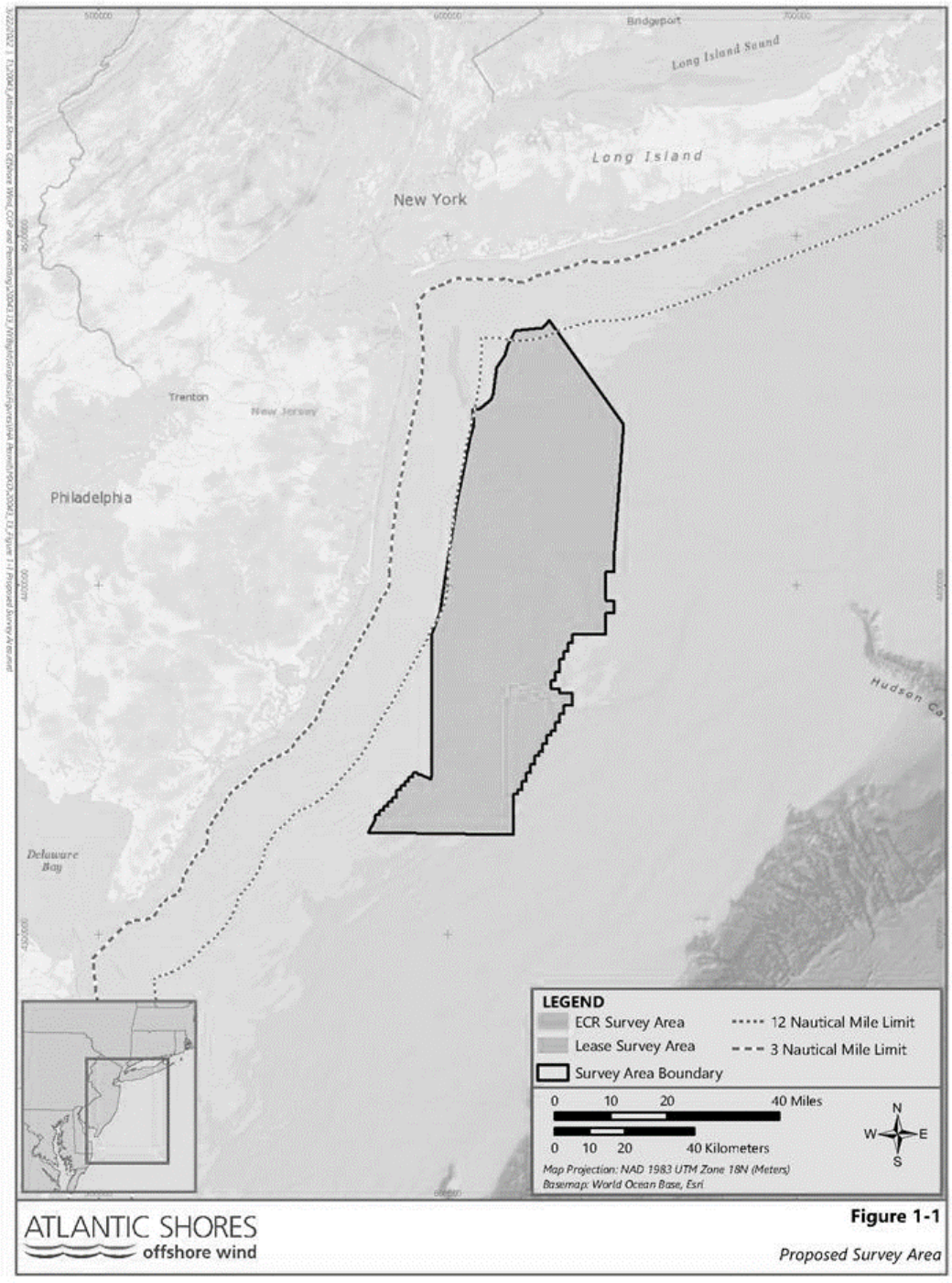

Figure 1. Map of the Survey Area (OCS-A 0541 and ECR)

Detailed Description of Specific Activity

Atlantic Shores Bight proposes to conduct both geotechnical and HRG survey activities. The proposed geotechnical activities would include the drilling of sample boreholes, deep cone penetration tests (CPTs), and shallow CPTs. Such proposed activities have been performed before by Atlantic Shores and considerations of the impacts produced from geotechnical activities have been previously analyzed and included in the proposed 2020 **Federal Register** notice for Atlantic Shores' HRG activities (85 FR 7926; February 12, 2020). In that notification, NMFS determined that the likelihood of the proposed geotechnical surveys resulting in harassment of marine mammals was so low as to be discountable. As this information remains applicable and NMFS' determination has not changed, these activities will not be discussed further in this proposed notification.

Atlantic Shores Bight has proposed that HRG survey operations would be conducted continuously 24 hours a day. Based on 24-hour operations, the estimated total duration of the proposed activities would be approximately 360 survey days. This includes 180 days of survey activities in the Lease Survey Area and 180 days in ECR Survey Area (refer back to Table 1). As previously discussed above, this schedule includes potential downtime due to inclement weather or other project-related delays.

The HRG survey equipment to be used in the identified survey area will be similar to the HRG survey equipment used to support previous surveys conducted by Atlantic Shores and other offshore wind development projects along the Atlantic Coast. The HRG survey activities will be supported by vessels of sufficient size to accomplish the survey goals in each of the specified survey areas. There will be a maximum of three geophysical survey vessels working at any one time across the survey areas. HRG equipment will either be mounted to or towed behind the survey vessel at a typical survey speed of approximately 3.5 knots (6.5 km) per hour. The geophysical survey activities proposed by Atlantic Shores Bight would include the following:

- Depth sounding (multibeam depth sounder and single beam echosounder) to determine water depths and general bottom topography (currently estimated to range from approximately 16 feet (ft) (5 meters [m] to 131 ft [40 m] in depth);
- Magnetic intensity measurements (gradiometer) for detecting local variations in regional magnetic field from geological strata and potential ferrous objects on and below the bottom;
- Seafloor imaging (side scan sonar survey) for seabed sediment classification purposes to identify natural and man-made acoustic targets resting on the bottom as well as any anomalous features;
- Shallow penetration sub-bottom profiler (pinger/chirp) to map the near surface stratigraphy (top 0 ft to 16 ft [0 m to 5 m] soils below seabed); and
- Medium penetration sub-bottom profiler (chirps/parametric profilers/sparkers) to map deeper subsurface stratigraphy as needed (soils down to 246 ft [75 m] to 328 ft [100 m] below seabed). Based upon three years of previous survey experience (i.e., 2019 – 2021 surveys), Atlantic Shores Bight anticipates that it will operate the Applied Acoustics Dura-Spark and/or the Geo Marine Geo-Source to map deeper stratigraphy in the survey areas.
- Grab sampling to validate seabed classification using typical sample sizes between 0.1 m^2 and 0.2 m^2.

Table 2 identifies the representative survey equipment that may be used in support of planned geophysical survey activities. Operational parameters presented in Table 2 were obtained from the following sources: Crocker and Fratantonio (2016); manufacturer specifications; personal communication with manufacturers; agency correspondence; and Atlantic Shores/Atlantic Shores Bight. The make and model of the listed geophysical equipment may vary depending on availability and the final equipment choices will vary depending upon the final survey design, vessel availability, and survey contractor

selection. Geophysical surveys are expected to use several equipment types concurrently in order to collect multiple aspects of geophysical data along one transect. Selection of equipment combinations is based on specific survey objectives. All categories of representative HRG survey equipment shown in Table 2 work with operating frequencies <180 kHz.

Table 2. Summary of representative equipment specifications with operating frequencies below 180 kHz

HRG Survey Equipment	Representative Equipment	Operating Frequency Ranges (kHz)	Operational Source Level (dB_{RMS})	Beamwidth ranges (degrees)	Typical pulse durations RMS_{90} (millisecond)	Pulse Repetition Rate (Hz)
Sparker	Applied Acoustics Dura-Spark 240^	0.01 to 1.9	203	180	3.4	2
	Geo Marine Geo-Source	0.2 to 5	195	180	7.2	0.41
CHIRPs	Edgetech 2000-DSS	2 to 16	195	24	6.3	10
	Edgetech 216	2 to 16	179	17, 20, 0r 24	10	10
	Edgetech 424	4 to 24	180	71	4	2
	Edgetech 512i	0.7 to 12	179	80	9	8
	Pangeosubsea Sub-	4 to 12.5	190	120	4.5	44

	Bottom ImagerTM					

^ The operational source level for the Dura-Spark 240 is assigned based on the value closest to the field operational history of the Dura-Spark 240 [operating between 500 – 600 J] found in Table 10 in Crocker and Fratantonio (2016), which reports a 203 dB_{RMS} for 500 J source setting and 400 tips. Because Crocker and Fratantonio (2016) did not provide other source levels for the Dura-Spark 240 near the known operational range, the SIG ELC 820 @750 J at 5m depth assuming an omnidirectional beam width was considered as a proxy or comparison to the Dura-Spark 240. The corresponding 203 dB_{RMS} level is considered a realistic and conservative value that aligns with the history of operations of the Dura-Spark 240 over three years of survey by Atlantic Shores.

The deployment of HRG survey equipment, including the equipment planned for use during Atlantic Shores Bight's proposed activities, produces sound in the marine environment that has the potential to result in harassment of marine mammals. Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Proposed Mitigation** and **Proposed Monitoring and Reporting**).

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species. NMFS fully considered all of this information, and we refer the reader to these descriptions, incorporated here by reference, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species)*.

Table 3 lists all species or stocks for which take is expected and proposed to be authorized for this action, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no serious injury or mortality is anticipated or authorized, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species or stocks and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. draft 2021 U.S. Atlantic and Gulf of Mexico SARs. All values presented in Table 3 are the most recent available at the time of publication and are available in the draft 2021 SARs (available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports*).

Table 3. Species Likely Impacted by the Specified Activities

Common Name	Scientific Name	Stock	ESA/MMPA status; strategic (Y/N)[1]	Stock abundance (CV, N_{min}, most recent abundance survey)[2]	PBR	Annual M/SI[3]

Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
North Atlantic right whale	*Eubalaena glacialis*	Western Atlantic	E/D, Y	368 (0; 364; 2019)[5]	0.7	7.7
Humpback whale	*Megaptera novaeangliae*	Gulf of Maine	-/-, Y	1,396 (0; 1,380; 2016)	22	12.15
Fin whale	*Balaenoptera physalus*	Western North Atlantic	E/D, Y	6,802 (0.24; 5,573; 2016)	11	1.8
Sei whale	*Balaenoptera borealis*	Nova Scotia	E/D, Y	6,292 (1.02; 3,098; 2016)	6.2	0.8
Minke whale	*Balaenoptera acutorostrata*	Canadian East Coastal	-/-, N	21,968 (0.31; 17,002; 2016)	170	10.6
Order Cetartiodactyla—Cetacea—Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						

Sperm whale	*Physeter macrocephalus*	North Atlantic	E/D, Y	4,349 (0.28; 3,451; 2016)	3.9	0
Long-finned pilot whale	*Globicephala melas*	Western North Atlantic	-/-, N	39,215 (0.3; 30,627; 2016)	306	29
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	Western North Atlantic	-/-, N	93,233 (0.71; 54,443; 2016)	544	27
Bottlenose dolphin	*Tursiops truncatus*	Western North Atlantic Offshore	-/-, N	62,851 (0.23; 51,914; 2016)	519	28
Common dolphin	*Delphinus delphis*	Western North Atlantic	-/-, N	172,974(0.21, 145,216, 2016)	1,452	390
Atlantic spotted dolphin	*Stenella frontalis*	Western North Atlantic	-/-, N	39,921 (0.27; 32,032; 2016)	320	0
Risso's dolphin	*Grampus griseus*	Western North Atlantic Sock	-/-, N	35,215 (0.19; 30,051; 2016)	301	34

Harbor porpoise	*Phocoena phocoena*	Gulf of Maine/Bay of Fundy	-/-, N	95,543 (0.31; 74,034; 2016)	851	164
Order Carnivora—Superfamily Pinnipedia						
Harbor seal	*Phoca vitulina*	Western North Atlantic	-/-, N	61,336 (0.08; 57,637; 2018)	1,729	339
Gray seal[4]	*Halichoerus grypus*	Western North Atlantic	-/-, N	27,300 (0.22; 22,785; 2018)	1,389	4,453

[1] *ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.*

[2] *NMFS marine mammal stock assessment reports online at: www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments. CV is the coefficient of variation;* N_{min} *is the minimum estimate of stock abundance. In some cases, CV is not applicable.*

[3] *These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike).*

[4] *NMFS' stock abundance estimate (and associated PBR value) applies to U.S. populations only. Total stock abundance (including animals in Canada) is approximately 451,431. The annual M/SI value given is for the total stock.*

[5] The draft 2022 SARs have yet to be released; however, NMFS has updated its species web page to recognize the population estimate for NARWs is now below 350 animals (https://www.fisheries.noaa.gov/species/north-atlantic-right-whale).

As indicated above, all 15 species (with 15 managed stocks) in Table 3 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. Four marine mammal species that are listed under the ESA may be present in the survey area and are included in the take request: The North Atlantic right, fin, sei, and sperm whale. The temporal and/or spatial occurrence of several cetacean and pinniped species listed in Table 3-1 of Atlantic Shores Bight's 2022 IHA application is such that take of these species is not expected to occur either because they have very low densities in the survey area or are known to occur further offshore than the survey area. These include: The blue whale (*Balaenoptera musculus*), Cuvier's beaked whale (*Ziphius cavirostris*), four species of Mesoplodont beaked whale (*Mesoplodon* spp.), dwarf and pygmy sperm whale (*Kogia sima* and *Kogia breviceps*), killer whale (*Orcinus orca*), false killer whale (*Pseudorca crassidens*), short-finned pilot whale (*Globicephala macrorhynchus*), striped dolphin (*Stenella coeruleoalba*), white-beaked dolphin (*Lagenorhynchus albirostris*), northern migratory stock of bottlenose dolphins, pantropical spotted dolphin (*Stenella attenuata*), hooded seal (*Cystophora cristata*), and harp seal (*Pagophilus groenlandicus*). As harassment and subsequent take of these species is not anticipated as a result of the proposed activities, these species are not analyzed or discussed further.

In addition, the Florida manatee (*Trichechus manatus;* a sub-species of the West Indian manatee) has been previously documented as an occasional visitor to the Northeast region during summer months (U.S. Fish and Wildlife Service (USFWS), 2019). However, manatees are managed by the U.S. Fish and Wildlife Service (USFWS) and are not considered further in this document.

For the majority of species potentially present in the specific geographic region, NMFS has designated only a single generic stock (*e.g.,* "western North Atlantic") for management purposes. This includes the "Canadian east coast" stock of minke whales, which includes all minke whales found in U.S. waters. For humpback whales, NMFS defines stocks on the basis of feeding locations, *i.e.,* Gulf of Maine. However, references to humpback whales in this document refer to any individuals of the species that are found in the specific geographic region. Additional information on these animals can be found in Sections 3 and 4 of Atlantic Shores' IHA application, the draft 2021 SARs (*https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*), and NMFS' website.

Below is a description of the species that have the highest likelihood of occurring in the survey area and are thus expected to potentially be taken by the proposed activities as well as further detail on the baseline for select species (*i.e.,* information regarding current Unusual Mortality Events (UMEs) and important habitat areas).

North Atlantic Right Whale

The North Atlantic right whale (NARW) ranges from calving grounds in the southeastern United States to feeding grounds in New England waters and into Canadian waters (Hayes *et al.,* 2021). Surveys identify seven areas in which NARWs congregate seasonally, including north and east of the proposed survey area in Georges Bank, off Cape Cod, and in Massachusetts Bay (Hayes *et al.,* 2020). In the late fall months (*e.g.,* October), right whales are generally thought to depart from the feeding grounds in the North Atlantic and move south to their calving grounds off Georgia and Florida. Migrating NARWs have been acoustically detected in the New York Bight from February to May, likely migrating north to their feeding grounds (Biedron *et al.,* 2009). However, recent research indicates that our understanding of NARW movement patterns remains incomplete (Davis *et al.,* 2017). For example, there has been an apparent shift in

habitat use patterns (Davis *et al.,* 2017), which includes an increased use of Cape Cod Bay (Mayo *et al.,* 2018) and decreased use of the Great South Channel. A review of passive acoustic monitoring data from 2004 to 2014 throughout the western North Atlantic demonstrated nearly continuous year-round right whale presence across their entire habitat range (for at least some individuals), including in locations previously thought of as migratory corridors, suggesting that not all of the population undergoes a consistent annual migration (Davis *et al.,* 2017). Observations of NARWs feeding in winter in the Mid-Atlantic region and recorded off the coast of New Jersey in all months of the year (Whitt *et al.,* 2013) support the theory that not all NARWs undergo consistent annual migrations. However, given that Atlantic Shores Bight's surveys would be concentrated offshore New Jersey and New York, any right whales in the vicinity of the survey area are expected to be transient and would most likely migrate through the region.

The western North Atlantic population demonstrated overall growth of 2.8 percent per year between 1990 to 2010, despite a decline in 1993 and no growth between 1997 and 2000 (Pace *et al.,* 2017). However, since 2010 the population has been in decline, with a 99.99 percent probability of a decline of just under 1 percent per year (Pace *et al.,* 2017). Between 1990 and 2015, calving rates varied substantially, with low calving rates coinciding with all three periods of decline or no growth (Pace *et al.,* 2017). On average, North Atlantic right whale calving rates are estimated to be roughly half that of southern right whales (*Eubalaena australis*) (Pace *et al.,* 2017), which are increasing in abundance (NMFS, 2015). In 2018, no new NARW calves were documented in their calving grounds; this represented the first time since annual NOAA aerial surveys began in 1989 that no new right whale calves were observed. Eighteen right whale calves were documented in 2021. As of May 9, 2022 and the writing of this proposed Notification, fifteen NARW calves were documented to have been born during this calving season.

Presently, the best available population estimate for NARWs is 386 per the draft 2021 SARs (*https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*). As noted in footnote to Table 2, NMFS has acknowledged that the population estimate of North Atlantic right whales is now under 350 animals (*https://www.fisheries.noaa.gov/species/north-atlantic-right-whale*). However, NMFS has determined that this change in abundance estimate would not change the estimated take of North Atlantic right whales or authorized take numbers, nor affect our ability to make the required findings under the MMPA for Atlantic Shores Bight's survey activities. The status and trends of the NARW population remain unchanged.

NMFS has designated two critical habitat areas for the NARW under the ESA: The Gulf of Atlantic Shores Bight Maine/Georges Bank region, and the southeast calving grounds from North Carolina to Florida. Two additional critical habitat areas in Canadian waters, Grand Manan Basin and Roseway Basin, were identified in Canada's final recovery strategy for the NARW (Brown *et al.,* 2009).

The proposed survey area is part of a migratory corridor Biologically Important Area (BIA) for NARWs (effective March-April and November-December) that extends from Massachusetts to Florida (LeBrecque *et al.,* 2015). Off the coast of New Jersey, the migratory BIA extends from the coast to beyond the shelf break. This important migratory area is approximately 269,488 km^2 in size (compared with the approximately 11,134.6 km^2 of total estimated Level B harassment ensonified area associated with the 360 planned survey days) and is comprised of the waters of the continental shelf offshore the East Coast of the United States, extending from Florida through Massachusetts. NMFS' regulations at 50 CFR § 224.105 designated nearshore waters of the Mid-Atlantic Bight as Mid-Atlantic U.S. Seasonal Management Areas (SMA) for North Atlantic right whales in 2008. SMAs were developed to reduce the threat of collisions between ships and right whales around their migratory route and calving grounds. A portion of one

SMA, which occurs off the ports of New York and New Jersey, overlaps spatially with a section of the proposed survey area, as shown by Figure 4-1 in the application. The SMA is active from November 1 through April 30 of each year. Within SMAs, the regulations require a mandatory vessel speed (less than 10 knots) for all vessels greater than 65 ft. (19.8 m).

Historically, there have been several documented sightings of NARWs off the coast of New Jersey and surrounding waters (CETAP, 1982; Knowlton and Kraus, 2001; Biedron *et al.,* 2009). Satellite-monitored radio tags on a NARW cow and calf documented the migratory route of this pair from the Bay of Fundy to New Jersey and back during a six-week period (Knowlton *et al.,* 2002). A few NARW sightings were documented west of the south of the Lease Survey Area near the Delaware Bay in October, December, May, and July (Knowlton *et al.,* 2002). Other visual recordings of NARWs were found in New Jersey waters during the spring and fall seasons (CETAP, 1982). It has been noted, however, that NARW sightings in several traditional feeding habitats has been declining, supporting speculation that a shift in NARW habitat usage may be occurring (Pettis *et al.,* 2017).

Elevated NARW mortalities have occurred since June 7, 2017, along the U.S. and Canadian coasts. This event has been declared an Unusual Mortality Event (UME), with human interactions, including entanglement in fixed fishing gear and vessel strikes, implicated in at least 15 of the mortalities. As of May 9, 2022, a total of 34 confirmed dead stranded whales (21 in Canada; 13 in the United States) have been documented. The cumulative total number of animals in the NARW UME has been updated to 50 individuals to include both the confirmed mortalities (dead stranded or floaters) (n=34) and seriously injured free-swimming whales (n=16) to better reflect the confirmed number of whales likely removed from the population during the UME and more accurately reflect the population impacts. More information is available online at:

www.fisheries.noaa.gov/national/marine-life-distress/2017-2021-north-atlantic-right-whale-unusual-mortality-event.

Humpback Whale

Prior to 2016, humpback whales were listed under the ESA as an endangered species worldwide. Following a 2015 global status review (Bettridge *et al*., 2015), NMFS delineated 14 distinct population segments (DPS) with different listing statuses (81 FR 62259; September 8, 2016) pursuant to the ESA. The West Indies DPS, which is not listed under the ESA, is the only DPS of humpback whales that is expected to occur in the survey area. Bettridge *et al*. (2015) estimated the size of this population at 12,312 (95 percent CI 8,688-15,954) whales in 2004-05, which is consistent with previous population estimates of approximately 10,000-11,000 whales (Stevick *et al*., 2003; Smith *et al*., 1999) and the increasing trend for the West Indies DPS (Bettridge *et al*., 2015). Whales occurring in the survey area are considered to be from the West Indies DPS, but are not necessarily from the Gulf of Maine feeding population managed as a stock by NMFS.

Humpback whales are known to occur regularly throughout the Mid-Atlantic Bight, including New Jersey waters (Geo-Marine, 2010). The occurrence of this population is strongly seasonal with most observations occurring during the spring and fall, with a peak from April to June (Geo-Marine, 2010; Curtice *et al.,* 2019). Group size tends to be single animals or pairs with a mean distance from shore of 11.4 mi (18.4 km) and a mean depth of 67 ft (20.5 m) (Geo-Marine, 2010). Acoustic data indicate that this species may be present within the surrounding areas year-round, with the highest rates of acoustic detections in adjacent waters in winter and spring (Kraus *et al.,* 2016). Since acoustic detections do not differentiate between individuals, detections on multiple days could be the same or different individuals.

Humpback whales utilize the mid-Atlantic region mainly as a migration pathway between calving/mating grounds to the south and feeding grounds in the north (Waring *et al.,* 2007a; Waring *et al.,* 2007b). However, Barco *et al.,* (2002) suggests that the mid-Atlantic region also represents a supplemental winter-feeding ground for humpbacks. Humpback whales belonging to the West Indies DPS typically feed in the waters between the Gulf of Maine and Newfoundland during spring, summer, and fall, but they have been observed feeding in other areas, such as off the coast of New York (Sieswerda *et al.,* 2015). A biologically important area (BIA) for humpback whales for feeding from March to December has been designated in the Gulf of Maine, Stellwagen Bank, and the Great South Channel; all of which are north of the survey area (LaBrecque *et al.,* 2015).

Despite the seasonality of occurrence, there have been some wintertime humpback sightings in coastal waters of the eastern U.S., including 46 sightings of humpbacks in the New York-New Jersey Harbor Estuary documented between 2011 and 2016 (Brown *et al.,* 2017). There have also been documented strandings from the New Jersey coast (Barco *et al.,* 2002). Humpback whales have been observed feeding off the coast of New Jersey with juveniles exhibiting feeding behavior south of the study area near the mouth of the Chesapeake Bay (Swingle *et al.,* 2006). Additionally, a cow-calf pair was seen north of the study area boundary supporting the theory that the nearshore waters off of New Jersey may provide important feeding and nursery habitats for humpback whales (Geo-Marine, 2010). In addition, recent research by King *et al.* (2021) has demonstrated a higher occurrence and foraging use of the New York Bight area by humpback whales than previously known.

The most significant anthropogenic causes of mortality of humpback whales include incidental fishery entanglements, responsible for roughly eight whale mortalities, and vessel collisions, responsible for four mortalities both on average annually from 2013 to 2017 (Hayes *et al.,* 2020). Furthermore, King *et al.* (2021) highlights important

concerns for humpback whales found specifically in the nearshore environment (<10 km from shore) from various anthropogenic impacts.

Since January 2016, elevated humpback whale mortalities have occurred along the Atlantic coast from Maine to Florida. A total of 159 humpback whale mortalities have occurred along the east coast of the U.S. since 2016 with 4 mortalities occurring in 2022 (NOAA Fisheries 2022a). Partial or full necropsy examinations have been conducted on approximately half of the 159 known cases (as of May 6, 2022). Of the whales examined, about 50 percent had evidence of human interaction, either ship strike or entanglement. While a portion of the whales have shown evidence of pre-mortem vessel strike, this finding is not consistent across all whales examined and more research is needed. NOAA is consulting with researchers that are conducting studies on the humpback whale populations, and these efforts may provide information on changes in whale distribution and habitat use that could provide additional insight into how these vessel interactions occurred. Three previous UMEs involving humpback whales have occurred since 2000, in 2003, 2005, and 2006. More information is available at: *www.fisheries.noaa.gov/national/marine-life-distress/2016-2021-humpback-whale-unusual-mortality-event-along-atlantic-coast.*

Fin Whale

Fin whales are common in waters of the U.S. Atlantic Exclusive Economic Zone (EEZ), principally from Cape Hatteras northward (Hayes *et al.,* 2020). There is evidence that fin whales are present year-round throughout much of the U.S. EEZ north of 35° N, but the density of individuals in any one area changes seasonally (NOAA Fisheries 2022b, Hayes *et al.,* 2020). Fin whales have a high multi-seasonal relative abundance in U.S. Mid-Atlantic waters, and surrounding areas. During the Geo-Marine (2010) surveys, most of the sightings off southern New Jersey were observed during winter and summer. There were mixed aggregations of feeding humpbacks during fin whale sightings, and

with the presence of known prey species, it is possible that fin whales use the area off southern New Jersey to feed (Geo-Marine, 2010). Within the southern New Jersey study area, group size ranged from one to four animals with a mean distance from shore of 20 km and a mean water depth of 21.5 m (Geo-Marine, 2010). Acoustic data also indicate that this species is present off New Jersey in all seasons (CETAP, 1982).

While the typical feeding grounds of fin whales include the Gulf of Maine and the waters surrounding New England, their mating, calving, and general wintering areas are largely unknown (Hain *et al.,* 1992; Hayes *et al.,* 2020). Recordings from Massachusetts Bay, New York Bight, and deep-ocean areas have detected some level of fin whale singing from September through June (Watkins *et al.,* 1987; Clark and Gagnon, 2002; Morano *et al.,* 2012). These acoustic observations from both coastal and deep-ocean regions support the conclusion that male fin whales are broadly distributed throughout the western North Atlantic for most of the year (Hayes *et al.,* 2020). Based on an analysis of neonate stranding data, Hain *et al.* (1992) suggest that calving occurs during October to January in latitudes of the U.S. Mid-Atlantic region.

The fin whale is federally listed under the ESA as an endangered marine mammal and are designated as a strategic stock under the MMPA due to their endangered status under the ESA, uncertain human-caused mortality, and incomplete survey coverage of the stock's defined range. The main threats to fin whales are fishery interactions and vessel collisions (Hayes *et al.,* 2021). A fin whale feeding BIA is located northeast of the study area near Rhode Island Sound (LaBrecque *et al.,* 2015).

Sei Whale

Sei whales present within the study area belong to the Nova Scotia stock, which occurs within the U.S. Atlantic EEZ and ranges along the continental shelf waters of the northeastern U.S. to Newfoundland (Hayes *et al.,* 2020). The southern portion of the stock's range during spring and summer includes the Gulf of Maine and Georges Bank,

an area also identified as a sei whale feeding BIA (LaBrecque *et al.,* 2015). Spring is the period of greatest abundance in U.S. waters, with sightings concentrated along the eastern margin of Georges Bank and into the Northeast Channel area, and along the southwestern edge of Georges Bank in the area of Hydrographer Canyon (Hayes *et al.,* 2020). Sei whales occur in shallower waters to feed. The wintering habitat for sei whales remains largely unknown (Hayes *et al.,* 2020).

There has been little detection of sei whales within New Jersey and surrounding waters (Kenney *et al.,* 1985; Geo-Marine, 2010). According to the New Jersey Endangered and Nongame Species Program (NJ ENSP), there have been no sightings of this species documented within state waters. On the continental shelf offshore of New Jersey, sei whales have been detected in spring. Approximately 200 sei whale vocalizations were detected in mid-September 2006 on the mid-Atlantic continental shelf, in waters ranging from 13 m to 80 m in depth (Newhall *et al.,* 2009).

Sei whales are listed as endangered under the ESA, and the Nova Scotia stock is considered strategic and depleted under the MMPA. The main threats to this stock are interactions with fisheries and vessel collisions. Impacts from environmental contaminants also present a concern as well as potential spatial shifts in distribution related to climate change (Hayes *et al.,* 2020; Sousa *et al.,* 2019).

Minke Whale

Minke whales can be found in temperate, tropical, and high-latitude waters. The Canadian East Coast stock can be found in the area from the western half of the Davis Strait (45 °W) to the Gulf of Mexico (Hayes *et al.,* 2021). This species generally occupies waters less than 100-m deep on the continental shelf. There appears to be a strong seasonal component to minke whale distribution on the continental shelf and in deeper off-shelf waters, in which spring to fall are times of relatively widespread and common acoustic occurrence (*e.g.,* Risch *et al.,* 2013). September through April is the period of

highest acoustic occurrence in deep-ocean waters throughout most of the western North Atlantic (Clark and Gagnon, 2002; Risch *et al.,* 2014).

Minke whales are primarily documented near the continental shelf offshore of New Jersey (Schwartz, 1962; Mead, 1975; Potter, 1979; Rowlett, 1980; Potter, 1984; Winn *et al.,* 1985, DoN, 2005). Acoustic recordings of minke whales have been detected north of the Lease survey area within the New York Bight during the fall (August to December) and winter (February to May) (Biedron *et al.,* 2009). Minke whales are most common off New Jersey in coastal waters in the spring and early summer as they move north to feeding ground in New England and fall as they migrate south (Geo-Marine, 2010). Geo-Marine (2010) observed four minke whales near the survey area and surrounding waters during winter and spring. A juvenile minke whale was sighted northwest of the Lease survey area near the New York Harbor in April 2007 (Hamazaki, 2002). Minke whale sightings off the coast of New Jersey were within water depths of 36 ft to 79 ft (11 m to 24 m) and temperatures ranging from 5.4 to 11.5°C (47°F) (Geo-Marine, 2010).

Based on habitat information and predictive habitat models, Hamazaki (2002) determined that minke whales are likely to occur in nearshore waters off New Jersey.

Since January 2017, elevated minke whale mortalities have occurred along the Atlantic coast from Maine through South Carolina, with a total of 122 strandings (as of May 9, 2022). This event has been declared a UME. Full or partial necropsy examinations were conducted on more than 60 percent of the whales. Preliminary findings in several of the whales have shown evidence of human interactions or infectious disease, but these findings are not consistent across all of the whales examined, so more research is needed. More information is available at: *www.fisheries.noaa.gov/national/marine-life-distress/2017-2021-minke-whale-unusual-mortality-event-along-atlantic-coast.*

Sperm Whale

The distribution of the sperm whale in the U.S. EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Hayes *et al.,* 2020). The basic social unit of the sperm whale appears to be a mixed school of adult females, their calves and some juveniles of both sexes, normally numbering 20-40 animals. There is evidence that some social bonds persist for many years (Christal *et al.,* 1998). This species forms stable social groups, site fidelity, and latitudinal range limitations in groups of females and juveniles (Whitehead, 2002). In contrast, males migrate to the Polar Regions to feed and move among populations to breed (Whitehead, 2002; Englehaupt *et al.,* 2009).

Within U.S. Atlantic EEZ waters, sperm whales appear to exhibit seasonal movement patterns (CETAP, 1982, Scott and Sadove, 1997). In winter, sperm whales are concentrated east and northeast of Cape Hatteras. This distribution shifts northward in spring, when sperm whales are most abundant in the central portion of the Mid-Atlantic Bight to the southern region of Georges Bank. In summer, this distribution continues to move northward, including the area east and north of Georges Bank and the continental shelf to the Mid-Atlantic region. In fall, sperm whales are most abundant on the continental shelf to the south of New England and remain abundant along the continental shelf edge in the Mid-Atlantic Bight (Hayes *et al.,* 2020).

No sperm whale sightings were made during the Ocean Wind Power Ecological Baseline Study off New Jersey (Geo-Marine, 2010); however, approximately nine individuals were observed offshore of New Jersey near the OCS during shipboard surveys in summer 2011 (Palka, 2012). There is substantial information on sperm whale occurrence offshore of New Jersey, exclusively near the OCS (CETAP, 1982; Waring *et al.,* 2007a) and are therefore likely to be present within the survey area.

Sperm whales are listed as engendered under the ESA, and the North Atlantic stock is considered strategic under the MMPA. The greatest threats to sperm whales include ship strikes ((McGillivary *et al.,* 2009; Carrillo and Ritter, 2010), anthropogenic sound (Nowacek *et al.,* 2015), and the potential for climate change to influence variations in spatial distribution and abundance of prey (Hayes *et al.,* 2020).

Long-finned Pilot Whale

Long-finned pilot whales are found from North Carolina to North Africa and the Mediterranean, and north to Iceland, Greenland and the Barents Sea (Hayes *et al.,* 2020). In U.S. Atlantic waters the species is distributed principally along the continental shelf edge off the northeastern U.S. coast in winter, early spring, and in late spring, long-finned pilot whales move onto Georges Bank and into the Gulf of Maine and more northern waters and remain in these areas through late autumn (CETAP, 1982; Hayes *et al.,* 2020).

Long-finned pilot whales have been known to occur offshore of New Jersey (Abend and Smith, 1999; Tyler, 2008; Hayes *et al.,* 2020). It is likely that the species can be found along the shelf break between New Jersey and Georges Bank, however, there is limited information on the spatial and temporal distribution of long-finned pilot whales near the survey area (Hayes *et al.,* 2020). For instance, pilot whales were not detected during the Geo-Marine (2010) study. The limited information of the presence of long-finned pilot whales within the survey area is likely based on the habitat preference and the pelagic nature of pilot whales (Hayes *et al.,* 2020) that would suggest pilot whales have a rare presence in New Jersey waters (Bowers-Altman and NJ Division of Fish and Wildlife, 2009).

Bottlenose Dolphin

There are two distinct bottlenose dolphin ecotypes in the western North Atlantic: coastal and offshore (Hersh and Duffield, 1990; Mead and Potter, 1995; Curry and Smith, 1997; Rosel *et al.,* 2009). The coastal ecotype is morphologically and genetically distinct

from the larger, more robust offshore ecotype that occupies habitats further offshore. The offshore ecotype is distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic Ocean from Georges Bank to the Florida Keys (CETAP, 1982; Kenney, 1990). North of Cape Hatteras, there is separation of the two ecotypes across bathymetry during summer months. Based upon genetic analyses, bottlenose dolphins concentrated close to shore were of the coastal ecotype, while those in waters > 25 m depth were from the offshore ecotype (Garrison *et al.,* 2003).

Off the coast of New Jersey, bottlenose dolphins, likely from the coastal migratory and offshore stocks, can occur throughout the year and were the most frequently detected species in an ecological baseline survey conducted in coastal New Jersey waters (Geo-Marine, 2010; BOEM, 2012). Seasonal movements of bottlenose dolphins north along the coast during the warmer months are likely directed by the presence of prey (Barco *et al.,* 1999; Hayes *et al.,* 2018). Targeted prey species vary by area, season, and stock; however, sciaenid fishes, such as Atlantic croaker and weakfish, and squid, are common (Gannon and Waples, 2004). Bottlenose dolphins were the most frequently observed species during the Geo-Marine (2010) study period. A total of 319 bottlenose dolphins with group sizes averaging at 15.3 animals were detected offshore of New Jersey (Geo-Marine 2010). Several other monitoring efforts recorded sightings of this species during geophysical surveys in the potential windfarm sites (including the survey area) southeast of Atlantic City (Geo-Marine 2009a, 2009b). Bottlenose dolphins have been present annually near and offshore of New Jersey, with greater sightings during spring and summer months (Geo-Marine, 2010). Given the northern migratory coastal stock propensity to be found shallower than the 65.6 ft (20 m) depth isobath between Assateague, Virginia and Long Island, New York (Reeves *et al.,* 2002; Hayes *et al.,* 2020), the northern migratory coastal stock is not expected to occur in the survey area

which is located beyond the 65.6 ft (20 m) depth isobath. Only the offshore ecotype is expected to occur within the study area.

Common Dolphin

Common dolphins within the U.S. Atlantic EEZ belong to the Western North Atlantic stock, generally occurring from Cape Hatteras to the Scotian Shelf (Hayes *et al.,* 2021). Common dolphins are a highly seasonal, migratory species. Within the U.S. Atlantic EEZ, this species is distributed along the continental shelf and typically associated with Gulf Stream features (CETAP, 1982; Selzer and Payne, 1988; Hamazaki, 2002; Hayes *et al.,* 2021). Common dolphins occur from Cape Hatteras northeast to Georges Bank (35° to 42°N) during mid-January to May and move as far north as the Scotian Shelf from mid-summer to fall (Selzer and Payne, 1988). Migration onto the Scotian Shelf and continental shelf off Newfoundland occurs when water temperatures exceed 51.8°Fahrenheit (11°Celsius) (Sergeant *et al.,* 1970, Gowans and Whitehead 1995). Breeding usually takes place between June and September (Hayes *et al.,* 2019).

There have been numerous sightings of common dolphins along the New Jersey coastline (Ulmer, 1981; Hamazaki, 2002). Generally, this species has been documented 20 nm (>37 km) near the shelf break within the months of February, May, and July, however, they have been sighted year-round (Geo-Marine 2010). Geo-Marine (2010) recorded a total of 32 common dolphin sightings off the coast of New Jersey in waters ranging from 33 ft to 102 ft (10 m to 21 m). Approximately 26% of the shipboard sightings of common dolphins were calves (Geo-Marine, 2010) study. Common dolphins are regularly observed in large groups consisting of hundreds of animals (NOAA Fisheries, 2022a). Multiple strandings of the common dolphins have occurred within the New Jersey coasts across multiple seasons (Hayes *et al.,* 2021).

Atlantic White-sided Dolphin

Atlantic white-sided dolphins observed off the U.S. Atlantic coast are part of the Western North Atlantic Stock (Hayes *et al.,* 2020). This stock inhabits waters from central West Greenland to North Carolina (about 35°N), primarily in continental shelf waters to the 328 ft (100 m) depth contour (Doksæter *et al.,* 2008). Sighting data indicate seasonal shifts in distribution (Northridge *et al.,* 1997). From January to May, low numbers of Atlantic white-sided dolphins are found from Georges Bank to Jeffrey's Ledge off New Hampshire. From June through September, large numbers of Atlantic white-sided dolphins are found from Georges Bank to the lower Bay of Fundy. From October to December, they occur at intermediate densities from southern Georges Bank to the southern Gulf of Maine (Payne and Heinemann, 1990).

Atlantic white-sided dolphins were not observed in the Geo-Marine (2010) study off New Jersey, suggesting that Atlantic white-sided dolphins occur infrequently in the survey area and surrounding areas. The NJ ENSP noted that there is little information on the sightings of this species and more information is needed to accurately assess the abundance of Atlantic white-sided dolphins within New Jersey waters (see CETAP, 1982; Selzer and Payne, 1988; Waring *et al.,* 2007a; Bowers-Altman and NJ Division of Fish and Wildlife, 2009). A shallow water (~188 ft [36 m]) marine mammal survey off of New Jersey found no presence of Atlantic white-sided dolphins across each season (Kenney *et al.,* 1985), which further implies that it is unlikely for this species to be present within the survey area. Although regional surveys found very limited presence of this species near the survey area, data adapted from Roberts *et al.* (2016b; 2017; 2018) via the MDAT (Curtice *et al.,* 2019) indicate abundance in this region increases in the spring so although unlikely, Atlantic white-sided dolphins may be present during HRG activities.

Atlantic Spotted Dolphin

Atlantic spotted dolphins are found in tropical and warm temperate waters ranging from southern New England, south to Gulf of Mexico and the Caribbean to Venezuela (Hayes *et al.,* 2020). The Western North Atlantic stock regularly occurs in continental shelf waters south of Cape Hatteras and in continental shelf edge and continental slope waters north of this region (Hayes *et al.,* 2020). There are two forms of this species, with the larger ecotype inhabiting the continental shelf and usually occurring inside or near the 200-m isobaths (Hayes *et al.,* 2020). Though the waters off the coast of New Jersey are located within the distributional range of the Atlantic spotted dolphin, the species was not observed in the Geo-marine (2010) study. It has been suggested that the species may move inshore seasonally during the spring, but data to support this theory is limited (Caldwell and Caldwell, 1966; Fritts *et al.,* 1983).

Risso's Dolphin

Risso's dolphins occur worldwide in both tropical and temperate waters (Jefferson *et al.,* 2008, Jefferson *et al.,* 2014). Risso's dolphins within the U.S. Atlantic EEZ are part of the Western North Atlantic stock. The Western North Atlantic stock of Risso's dolphins inhabits waters from Florida to eastern Newfoundland (Leatherwood *et al.,* 1976; Baird and Stacey, 1991). During spring, summer, and fall, Risso's dolphins are distributed along the continental shelf edge from Cape Hatteras northward to Georges Bank (CETAP, 1982; Payne *et al.,* 1984). During the winter, the distribution extends outward into oceanic waters (Payne *et al.,* 1984) within the Mid-Atlantic Bight, however, little is known about movement and migration patterns and Risso's dolphins are infrequently observed in continental shelf waters.

There is limited data regarding Risso's dolphins offshore of New Jersey. Increased strandings of this species were recorded from 2003 to 2004 on New York, New Jersey, and Delaware coasts (DiGiovanni *et al.,* 2005). This species has also been primarily documented on the shelf break off of New Jersey (DiGiovanni *et al.,* 2005).

There were no Risso's dolphins documented during the Geo-Marine (2010) study, however, one Risso's dolphin observation was recorded during Atlantic Shores 2020 geophysical campaign in the vicinity of the survey area.

Harbor Porpoise

The harbor porpoise occupies U.S. and Canadian waters. During summer (July to September), harbor porpoises are generally concentrated along the continental shelf within the northern Gulf of Maine, southern Bay of Fundy region, and around the southern tip of Nova Scotia, generally in waters less than 150 m deep (Gaskin, 1977; Kraus *et al.,* 1983; Palka, 1995). During fall (October to December) and spring (April to June), they are more widely dispersed from New Jersey to Maine with lower densities farther north and south. In winter (January to March), intermediate densities of harbor porpoises can be found in waters off New Jersey to North Carolina with lower densities found in waters off New York to New Brunswick, Canada (Hayes *et al.,* 2020).

There are four distinct populations of harbor porpoise in the western Atlantic: Gulf of Maine/Bay of Fundy, Gulf of St. Lawrence, Newfoundland, and Greenland (Gaskin, 1984, 1992; Hayes *et al.,* 2020). Harbor porpoises observed within the U.S. Atlantic EEZ are considered part of the Gulf of Maine/Bay of Fundy stock. Harbor porpoises are a frequently sighted cetacean offshore of New Jersey (Geo-Marine, 2010). During the Geo-Marine (2010) study off New Jersey, 51 harbor porpoise sightings were documented approximately 0.8 to 19.8 nm (1.5 to 36.6 km) from shore. These sightings were primarily during winter months (February to March). It is therefore likely that this marine mammal will be present within the survey area.

The main threat to harbor porpoises is interactions with fisheries, with documented take in the U.S. northeast sink gillnet, mid-Atlantic gillnet, and northeast bottom trawl fisheries (Hayes *et al.,* 2020).

Harbor Seal

Harbor seals are found throughout coastal waters of the Atlantic Ocean and adjoining seas above 30° N (Hayes *et al.,* 2020). In the western North Atlantic, they are distributed from eastern Canada to southern New England and New York, and occasionally as far south as the Carolinas (Payne and Selzer, 1989). Harbor seals are year-round inhabitants of the coastal waters of eastern Canada and Maine (Richardson and Rough, 1993), and occur seasonally from southern New England to New Jersey between September and late May (Schneider and Payne, 1983; Barlas, 1999; Schroeder, 2000). The western North Atlantic stock may occupy southern waters of the Mid-Atlantic Bight during seasonal migrations from the Bay of Fundy in the late autumn and winter (Palka *et al.,* 2017). A general southward movement from the Bay of Fundy to southern New England occurs in fall and early winter (Rosenfeld *et al.,* 1988, Whitman and Payne, 1990, Barlas 1999). A northward movement from southern New England to Maine and eastern Canada takes place prior to the pupping season, which occurs from mid-May through June along the Maine coast (Richardson, 1976; Wilson, 1978; Whitman and Payne, 1990; Kenney, 1994). Geo-Marine (2010) observed one harbor seal offshore of New Jersey during their survey effort.

In addition to coastal waters, harbor seals use terrestrial habitat as haul-out sites throughout the year, but primarily during the pupping and molting periods, which occur from late spring to late summer in the northern portion of their range. There are three major haul-out sites along the New Jersey coast, located in Great Bay, Sandy Hook, and Barnegat Inlet (CWFNJ, 2015).

Gray Seal

Gray seals are the second most common pinniped along the U.S. Atlantic coast (Jefferson *et al.,* 2008). Gray seals in the survey area belong to the Western North Atlantic stock. The range for this stock is thought to be from New Jersey to Labrador, and is centered at Sable Island, Nova Scotia (Davies, 1957; Mansfield, 1966; Katona *et al.,*

1993). This species inhabits temperate and sub-arctic waters and lives on remote, exposed islands, shoals, and unstable sandbars (Jefferson *et al.,* 2008). Gray seals range from Canada to New Jersey; however, stranding records as far south as Cape Hatteras (Gilbert *et al.,* 2005) have been recorded.

In U.S. waters, gray seals primarily pup at four established colonies: Muskeget and Monomoy islands in Massachusetts, and Green and Seal Islands in Maine. Since 2010, pupping has also been observed at Noman's Island in Massachusetts and Wooden Ball and Matinicus Rock in Maine (Hayes *et al.,* 2020). Although white-coated pups have stranded on eastern Long Island beaches in New York, no pupping colonies have been detected in that region. Following the breeding season, gray seals may spend several weeks ashore in late spring and early summer while undergoing a yearly molt.

Geo-Marine (2010) did not observe gray seals offshore of New Jersey. However, the Marine Mammal Stranding Center (2022) documented 25 gray seal strandings in New Jersey in 2019. Other reported sightings of gray seal in waters off of New Jersey were found as bycatch in gillnets (Hatch and Orphanides, 2017; Orphanides, 2019). Gray seals are less likely than harbor seals to occur around the survey area (Hayes *et al.,* 2020).

Since July 2018, elevated numbers of harbor seal and gray seal mortalities have occurred across Maine, New Hampshire and Massachusetts. This event has been declared a UME. Additionally, stranded seals have shown clinical signs as far south as Virginia, although not in elevated numbers, therefore the UME investigation now encompasses all seal strandings from Maine to Virginia. Ice seals (harp and hooded seals) have also started stranding with clinical signs, again not in elevated numbers, and those two seal species have also been added to the UME investigation. A total of 3,152 reported strandings (of all species) occurred from July 1, 2018 through March 13, 2020. Full or partial necropsy examinations have been conducted on some of the seals and samples have been collected for testing. Based on tests conducted thus far, the main pathogen

found in the seals is phocine distemper virus. NMFS is performing additional testing to identify other factors that may be involved in this UME. Presently, this UME is non-active and is pending closure by NMFS. Information on this UME is available online at: *www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2020-pinniped-unusual-mortality-event-along.*

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, etc.). Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 4.

Table 4. Marine Mammal Hearing Groups (NMFS, 2018).

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz

Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz
* Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al*., 2007) and PW pinniped (approximation).	

The pinniped functional hearing group was modified from Southall *et al*. (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al*., 2006; Kastelein *et al*., 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and their Habitat

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The **Estimated Take** section, later in this document, includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The **Negligible Impact Analysis and Determination** section considers the content of this section, the **Estimated Take** section, and the **Proposed Mitigation** section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals may or may not impact marine mammal species or stocks.

Background on active acoustic sound sources and acoustic terminology

This subsection provides relevant technical background information on sound, the characteristics of certain sound types, and the metrics used the proposed activity. The focused discussion also includes analysis of the potential effects of the specified activity

on marine mammals. For general information on sound and its interaction with the marine environment, please see, *e.g.,* Au and Hastings (2008); Richardson *et al.,* (1995); Urick (1983).

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz or cycles per second. Wavelength is the distance between two peaks or corresponding points of a sound wave (length of one cycle). Higher frequency sounds have shorter wavelengths than lower frequency sounds, and higher frequency sounds typically attenuate (decrease) more rapidly, except in certain cases in shallower water. Amplitude is the height of the sound pressure wave or the "loudness" of a sound and is typically described using the relative unit of the decibel. A sound pressure level (SPL) in dB is described as the ratio between a measured pressure and a reference pressure (for underwater sound, this is 1 microPascal (μPa)), and is a logarithmic unit that accounts for large variations in amplitude. Therefore, a relatively small change in dB corresponds to large changes in sound pressure. The source level (SL) represents the SPL referenced at a distance of 1-m from the source (referenced to 1 μPa), while the received level is the SPL at the listener's position (referenced to 1 μPa).

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Root mean square is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Root mean square accounts for both positive and negative values; squaring the pressures makes all values positive so they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

Sound exposure level (SEL; represented as dB re 1 μPa^2 -s) represents the total energy in a stated frequency band over a stated time interval or event and considers both intensity and duration of exposure. The per-pulse SEL is calculated over the time window containing the entire pulse (*i.e.,* 100 percent of the acoustic energy). SEL is a cumulative metric; it can be accumulated over a single pulse, or calculated over periods containing multiple pulses. Cumulative SEL represents the total energy accumulated by a receiver over a defined time window or during an event. Peak sound pressure (also referred to as zero-to-peak sound pressure or 0-pk) is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source and is represented in the same units as the rms sound pressure.

When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in a manner similar to ripples on the surface of a pond and may be directed either in a single beam or in multiple beams or may radiate in all directions (omnidirectional sources). The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound, which is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995). The sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* wind and waves, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic (*e.g.,* vessels, dredging, construction) sound. Many sources contribute to ambient sound, including wind and waves, which are a main source of naturally occurring ambient sound for frequencies

between 200 Hz and 50 kHz (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Precipitation can become an important component of total sound at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times. Marine mammals can contribute significantly to ambient sound levels, as can some fish and snapping shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz. Sources of ambient sound related to human activity include transportation (surface vessels), dredging and construction, oil and gas drilling and production, geophysical surveys, sonar, and explosions. Vessel noise typically dominates the total ambient sound for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly.

The sum of the various natural and anthropogenic sound sources that comprise ambient sound at any given location and time depends not only on the source levels (as determined by current weather conditions and levels of biological and human activity) but on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10-20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals. Details of source types are described in the following text.

Sounds are often considered to fall into one of two general types: Pulsed and non-pulsed (defined in the following). The distinction between these two sound types is

important because each sound type has differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.,* (2007) for an in-depth discussion of these concepts. The distinction between these two sound types is not always obvious, as certain signals share properties of both pulsed and non-pulsed sounds. A signal near a source could be categorized as a pulse, but due to propagation effects as the signal moves farther from the source, the signal duration becomes longer (*e.g.,* Greene and Richardson, 1988).

Pulsed sound sources (*e.g.,* airguns, explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986, 2005; Harris, 1998; NIOSH, 1998) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or intermittent (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

Sparkers produce pulsed signals with energy in the frequency ranges specified in Table 2. The amplitude of the acoustic wave emitted from sparker sources is equal in all directions (*i.e.,* omnidirectional), while other sources planned for use during the proposed surveys have some degree of directionality to the beam, as specified in Table 2. Other

sources planned for use during the proposed survey activity (*e.g.,* CHIRPs) should be considered non-pulsed, intermittent sources.

Summary on specific potential effects of acoustic sound sources

Underwater sound from active acoustic sources can include one or more of the following: Temporary or permanent hearing impairment, behavioral disturbance, masking, stress, and non-auditory physical effects. The degree of effect is intrinsically related to the signal characteristics, received level, distance from the source, and duration of the sound exposure. Marine mammals exposed to high-intensity sound, or to lower-intensity sound for prolonged periods, can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Finneran, 2015). TS can be permanent (PTS; permanent threshold shift), in which case the loss of hearing sensitivity is not fully recoverable, or temporary (TTS; temporary threshold shift), in which case the animal's hearing threshold recovers over time (Southall *et al.,* 2007).

Animals in the vicinity of Atlantic Shores Bight's proposed HRG survey activity are unlikely to incur even TTS due to the characteristics of the sound sources, which include relatively low source levels (176 to 205 dB re 1 µPa m), and generally very short pulses and potential duration of exposure. These characteristics mean that instantaneous exposure is unlikely to cause TTS as it is unlikely that exposure would occur close enough to the vessel for received levels to exceed peak pressure TTS criteria, and the cumulative duration of exposure would be insufficient to exceed cumulative sound exposure level (SEL) criteria. Regarding instantaneous exposure, high-frequency cetacean species (*e.g.,* harbor porpoises) have the greatest sensitivity to potential TTS, and individuals would have to make an approach within 5 m of the vessel (the estimated isopleth distance to the peak threshold). Intermittent exposures—as would occur due to the brief, transient signals produced by these sources—require a higher cumulative SEL to induce TTS than would continuous exposures of the same duration (*i.e.,* intermittent

exposure results in lower levels of TTS). Moreover, most marine mammals would more likely avoid loud sound sources rather than approach within close proximity to the vessel, and also remain within this distance to the vessel operating these sources in order to receive multiple exposures at relatively high levels, as would be necessary to cause TTS. Kremser *et al.* (2005) noted that the probability of a cetacean swimming through the area of exposure when a sub-bottom profiler emits a pulse is small—because if the animal was in the area, it would have to pass the transducer at close range in order to be subjected to sound levels that could cause TTS and would likely exhibit avoidance behavior to the area near the transducer rather than swim through at such a close range. Further, the restricted beam shape of some of the HRG survey devices planned for use (Table 2) makes it unlikely that an animal would be exposed more than briefly during the passage of the vessel.

Behavioral disturbance may include a variety of effects, including subtle changes in behavior (*e.g.,* minor or brief avoidance of an area or changes in vocalizations), more conspicuous changes in similar behavioral activities, and more sustained and/or potentially severe reactions, such as displacement from or abandonment of high-quality habitat. Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal.

In addition, sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation). Masking occurs when the receipt of a sound is interfered

with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* shipping, sonar, seismic exploration) in origin. Marine mammal communications would not likely be masked appreciably by the acoustic signals given the directionality of the signals for most HRG survey equipment types planned for use (Table 2) and the brief period when an individual mammal is likely to be exposed.

Classic stress responses begin when an animal's central nervous system perceives a potential threat to its homeostasis. That perception triggers stress responses regardless of whether a stimulus actually threatens the animal; the mere perception of a threat is sufficient to trigger a stress response (Moberg, 2000; Seyle, 1950). Once an animal's central nervous system perceives a threat, it mounts a biological response or defense that consists of a combination of the four general biological defense responses: Behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses. In the case of many stressors, an animal's first and sometimes most economical (in terms of biotic costs) response is behavioral avoidance of the potential stressor or avoidance of continued exposure to a stressor. An animal's second line of defense to stressors involves the sympathetic part of the autonomic nervous system and the classical "fight or flight" response which includes the cardiovascular system, the gastrointestinal system, the exocrine glands, and the adrenal medulla to produce changes in heart rate, blood pressure, and gastrointestinal activity that humans commonly associate with "stress." These responses have a relatively short duration and may or may not have significant long-term effect on an animal's welfare. An animal's third line of defense to stressors involves its neuroendocrine systems; the system that has received the most study has been the hypothalamus-pituitary-adrenal system (also known as the HPA axis in mammals). Unlike stress responses associated with the autonomic nervous system,

virtually all neuro-endocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction (Moberg, 1987; Rivier, 1995), reduced immune competence (Blecha, 2000), and behavioral disturbance. Increases in the circulation of glucocorticosteroids (cortisol, corticosterone, and aldosterone in marine mammals; see Romano *et al.,* 2004) have long been equated with stress. The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and distress is the biotic cost of the response. In general, there is little data on the potential for strong, anthropogenic underwater sounds to cause non-auditory physical effects in marine mammals. The available data does not allow identification of a specific exposure level above which non-auditory effects can be expected (Southall *et al.,* 2007). There is currently no definitive evidence that any of these effects occur even for marine mammals in close proximity to an anthropogenic sound source. In addition, marine mammals that show behavioral avoidance of survey vessels and related sound sources are unlikely to incur non-auditory impairment or other physical effects. NMFS does not expect that the generally short-term, intermittent, and transitory HRG and geotechnical survey activities would create conditions of long-term, continuous noise and chronic acoustic exposure leading to long-term physiological stress responses in marine mammals.

Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, and zooplankton) (*i.e.,* effects to marine mammal habitat). Prey species exposed to sound might move away from the sound source, experience TTS, experience masking of biologically relevant sounds, or show no obvious direct effects. The most likely impacts (if any) for most prey species in a given area would be temporary avoidance of the area. Surveys using active acoustic sound sources move through an area, limiting exposure to multiple pulses. In all

cases, sound levels would return to ambient once a survey ends and the noise source is shut down and, when exposure to sound ends, behavioral and/or physiological responses are expected to end relatively quickly.

Ship Strikes

Vessel collisions with marine mammals, or ship strikes, can result in death or serious injury of the animal. These interactions are typically associated with large whales, which are less maneuverable than smaller cetaceans or pinnipeds in relation to large vessels. Ship strikes often involve commercial shipping vessels, which are generally larger (*e.g.,* 40,000 ton container ship) and less able to notice collisions, or potential collisions, than smaller geophysical survey vessels. Jensen and Silber (2004) summarized ship strikes of large whales worldwide from 1975-2003 and found that most collisions occurred in the open ocean and involved large vessels (*e.g.,* commercial shipping). Atlantic Shores Bight vessels planned for use in the proposed activities range in length from 40 ft (12.2 m) to 292 ft (89 m). Vessel speed while towing gear will be approximately 3.5 knots. At these speeds, both the possibility of striking a marine mammal and the possibility of a strike resulting in serious injury or mortality are so low as to be discountable. At average transit speed for geophysical survey vessels, the probability of serious injury or mortality resulting from a strike is less than 50 percent. However, the likelihood of a strike actually happening is again low given the smaller size of these vessels and generally slower speeds. Notably in the Jensen and Silber study, no strike incidents were reported for geophysical survey vessels during that time period.

Marine mammal habitat

The HRG survey equipment will not contact the seafloor and does not represent a source of pollution. We are not aware of any available literature on impacts to marine mammal prey from sound produced by HRG survey equipment. However, as the HRG survey equipment introduces noise to the marine environment, there is the potential for it

to result in avoidance of the area around the HRG survey activities on the part of marine mammal prey. Any avoidance of the area on the part of marine mammal prey would be expected to be short term and temporary.

Because of the temporary nature of the disturbance, and the availability of similar habitat and resources (*e.g.,* prey species) in the surrounding area, the impacts to marine mammals and the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or their populations. Impacts on marine mammal habitat from the proposed activities will be temporary, insignificant, and discountable.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through this IHA, which will inform both NMFS' consideration of "small numbers," and the negligible impact determinations.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to HRG acoustic sources. Based on the nature of the activity, Level A harassment is neither anticipated nor proposed to be authorized. Level A harassment (injury) is considered unlikely based on the characteristics of the signals produced by the acoustic sources

planned for use. Implementation of required mitigation detailed in the **Proposed Mitigation** section below further reduces the potential for Level A harassment.

As described previously, no serious injury or mortality is anticipated or proposed to be authorized for this activity. Below we describe how the proposed take numbers are estimated.

For acoustic impacts, generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimates.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage,

depth) and can be difficult to predict (*e.g.*, Southall *et al.,* 2007, 2021, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) when exposed to underwater anthropogenic noise above received levels of 160 dB re 1 μPa (rms) for the impulsive sources (*i.e.,* sparkers) and non-impulsive, intermittent sources (*e.g.,* CHIRPs) evaluated here for Atlantic Shores Bight's proposed activity.

Atlantic Shores Bight's proposed HRG surveys include the use of non-impulsive, intermittent (CHIRPs) and impulsive (sparkers) sources, and therefore the RMS SPL threshold of 160 dB re 1 μPa is applicable.

Level A harassment – NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). Atlantic Shores Bight's proposed HRG survey activities include the use of impulsive (sparkers) and non-impulsive (CHIRPs) sources.

These thresholds are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS' 2018 Technical Guidance, which may be accessed at: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.*

Table 5. Thresholds Identifying the Onset of Permanent Threshold Shift.

	PTS Onset Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{p,0\text{-pk,flat}}$: 219 dB $L_{E,p,\ LF,24h}$: 183 dB	*Cell 2* $L_{E,p,\ LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{p,0\text{-pk,flat}}$: 230 dB $L_{E,p,\ MF,24h}$: 185 dB	*Cell 4* $L_{E,p,\ MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{p,0\text{-pk,flat}}$: 202 dB $L_{E,p,HF,24h}$: 155 dB	*Cell 6* $L_{E,p,\ HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{p,0\text{-pk.flat}}$: 218 dB $L_{E,p,PW,24h}$: 185 dB	*Cell 8* $L_{E,p,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{p,0\text{-pk,flat}}$: 232 dB $L_{E,p,OW,24h}$: 203 dB	*Cell 10* $L_{E,p,OW,24h}$: 219 dB

* Dual metric thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds are recommended for consideration.

Note: Peak sound pressure level ($L_{p,0\text{-pk}}$) has a reference value of 1 µPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1µPa^{2}s. In this Table, thresholds are abbreviated to be more reflective of International Organization for Standardization standards (ISO 2017). The subscript "flat" is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals (*i.e.*, 7 Hz to 160 kHz). The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these thresholds will be exceeded.

The 2020 Federal Register notice of proposed IHA for Atlantic Shores' HRG surveys (85 FR 7926; February 12, 2020) previously analyzed the potential for Level A harassment (refer to Table 5 in that notification and additional discussion therein).

Similar to the past IHAs issued to Atlantic Shores, the proposed activities for 2022-2023 include the use of impulsive (*i.e.,* sparkers) and non-impulsive (*e.g.,* CHIRPs) sources, and Atlantic Shores Bight did not request authorization of take by Level A harassment. The locations, species, survey durations, equipment used, and source levels proposed are all of a similar scope previously analyzed for Atlantic Shores' surveys. NMFS concluded for past surveys that Level A harassment was not a reasonably likely outcome for marine mammals exposed to noise through use of similar impulsive and non-impulsive HRG sources, therefore, the same conclusion applies to the sources proposed

for use here. Therefore, the potential for Level A harassment is not evaluated further in this document and no take by Level A harassment is proposed for authorization by NMFS. [Note that the proposed mitigation measures would further reduce the potential for Level A harassment.]

Ensonified Area

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

NMFS has developed a user-friendly methodology for estimating the extent of the Level B harassment isopleths associated with relevant HRG survey equipment (NMFS, 2020). This methodology incorporates frequency and directionality to refine estimated ensonified zones. For acoustic sources that operate with different beamwidths, the maximum beamwidth was used, and the lowest frequency of the source was used when calculating the frequency-dependent absorption coefficient (Table 2).

NMFS considers the data provided by Crocker and Fratantonio (2016) to represent the best available scientific information on source levels associated with HRG survey equipment and, therefore, recommends that source levels provided by Crocker and Fratantonio (2016) be incorporated in the method described above to estimate isopleth distances to harassment thresholds. In cases where the source level for a specific type of HRG equipment is not provided in Crocker and Fratantonio (2016), NMFS recommends that either the source levels provided by the manufacturer be used, or, in instances where source levels provided by the manufacturer are unavailable or unreliable, a proxy from Crocker and Fratantonio (2016) may be used instead. Table 2 shows the HRG equipment types that may be used during the proposed surveys and the source levels associated with those HRG equipment types. The computations and results from the Level B harassment ensonified area analysis are displayed in Table 6.

Table 6. Information inputs and resulting distances to Level B threshold (m) for representative acoustic sources.

Source information		Input values into Spreadsheet				Computed Values	
HRG Survey Equipment Type	Representative Equipment	Operating Frequencies Ranges (kHz)	Operational Source Level Ranges (dB_{RMS})	Beamwidth Ranges (degree)	Water depth (m)	Slant Threshold Range to Level B threshold (m)	Horizontal Threshold Range to Level B threshold (m)
Sparker	SIG ELC 820 sparker at 750J*	0.01	203	180	5	141	141
	Geo Marine Survey System 2D SUHRS	0.2	195	180	5	56	56
CHIRPs	Edgetech 2000-DSS	2	195	24	5	56	1.1
	Edgetech 216	2	179	24	5	9	1.1
	Edgetech 424	4	180	71	10	10	5.8
	Edgetech 512i	0.7	179	80	10	9	5.8

	Pangeosubsea Sub-Bottom ImagerTM	4	190	120	5	32	8.7

*Used as a proxy for the Applied Acoustics Dura-Spark 240 because the specific energy setting isn't described in Crocker and Franantonio (2016).

Results of modeling using the methodology described and shown above indicated that, of the HRG survey equipment planned for use by Atlantic Shores Bight that has the potential to result in Level B harassment of marine mammals, the Applied Acoustics Dura-Spark 240 would produce the largest Level B harassment isopleth (141 m; please refer to Table 6).

Although Atlantic Shores Bight does not expect to use sparker sources on all planned survey days and during the entire duration that surveys are likely to occur, Atlantic Shores Bight proposes to assume for purposes of analysis that the sparker would be used on all survey days. This is a conservative approach, as the actual sources used on individual survey days may produce smaller harassment distances.

The Level B harassment isopleth distance of 141 m generated for the Dura-Spark 240 was used as the "r" input to calculate the zone of influence (ZOI) around the survey vessel, which is the maximum ensonified area around the sound source over a 24 hour period. The following formula for a mobile source was used to calculate the ZOI:

Mobile Source ZOI = (Distance/day x 2r)+ πr2

Where: *Distance/day* = the maximum distance a survey vessel could travel in a 24-hour period; *r* = the maximum radial distance from a given sound source to the NOAA Level A or Level B harassment thresholds. For the purpose of the Atlantic Shores Bight HRG

surveys, the total *distance/day* has been estimated to be approximately 55.0 km in the survey area. Based upon a daily survey distance of 55 km/day and a maximum radial distance to the Level B harassment threshold (141 m, see Tables 6, 7), an area of 15.57 km^2 would be ensonified to the Level B harassment threshold across both survey sites during Atlantic Shores Bight's proposed surveys (Table 7).

Table 7. Maximum HRG Survey Area Distances and Daily Ensonified Areas

Survey area	Number of active survey days	Survey distances per day in km	Maximum radial distance (r) in m	Calculated Isopleth per day (km^2)	Total annual ensonified area (km^2)
Lease Area	180	55	141	15.57	2,802.6
ECR Survey Area	180				2,802.6

As described above, this is a conservative estimate as it assumes the HRG source that results in the greatest isopleth distance to the Level B harassment threshold would be operated at all times during the entire survey, which is not expected to ultimately occur.

Marine Mammal Occurrence

In this section we provide information about the occurrence of marine mammals, including density or other relevant information that will inform the take calculations.

Habitat-based density models produced by the Duke University Marine Geospatial Ecology Laboratory and the Marine-life Data and Analysis Team, based on the best available marine mammal data from 1992-2019 obtained in a collaboration between Duke University, the Northeast Regional Planning Body, the University of

North Carolina Wilmington, the Virginia Aquarium and Marine Science Center, and NOAA (Roberts *et al.,* 2016a; Curtice *et al.,* 2018), represent the best available scientific information regarding marine mammal densities in the survey area. More recently, these data have been updated with new modeling results and include density estimates for pinnipeds (Roberts *et al.,* 2016b, 2017, 2018, 2020).

The density data presented by Roberts *et al.,* (2016b, 2017, 2018, 2020) incorporates aerial and shipboard line-transect survey data from NMFS and other organizations and incorporates data from eight physiographic and 16 dynamic oceanographic and biological covariates, and controls for the influence of sea state, group size, availability bias, and perception bias on the probability of making a sighting. These density models were originally developed for all cetacean taxa in the U.S. Atlantic (Roberts *et al.,* 2016a). In subsequent years, certain models have been updated based on additional data as well as certain methodological improvements. More information is available online at *https://seamap.env.duke.edu/models/Duke/EC/.* Marine mammal density estimates in the survey area (animals/km^2) were obtained using the most recent model results for all taxa (Roberts *et al.,* 2016b, 2017, 2018, 2020). The updated models incorporate additional sighting data, including sightings from NOAA's Atlantic Marine Assessment Program for Protected Species (AMAPPS) surveys.

For the exposure analysis, density data from Roberts *et al.,* (2016b, 2017, 2018, 2020) were mapped using a geographic information system (GIS). For each of the survey areas (*i.e.,* Lease Survey Area, ECR Survey Area), the densities of each species as reported by Roberts *et al.* (2016b, 2017, 2018, 2020) were averaged by season; thus, a density was calculated for each species for spring, summer, fall and winter. The seasons were defined as follows: Spring (March- May); summer (June- August); fall (September- November); winter (December- February). To be conservative, the greatest seasonal density calculated for each species was then carried forward in the exposure analysis.

Estimated seasonal densities (animals per km^2) of all marine mammal species that may be taken by the proposed survey, for all survey areas are shown in Tables C-1, C-2 and C-3 in Appendix C of Atlantic Shores Bight's IHA application. The maximum seasonal density values used to estimate take numbers are shown in Table 9 below. Below, we discuss how densities were assumed to apply to specific species for which the Roberts *et al.* (2016b, 2017, 2018, 2020) models provide results at the genus or guild level.

For bottlenose dolphin densities, Roberts et al. (2016b, 2017, 2018) does not differentiate by individual stock. As the northern migratory coastal stock is not expected to occur in the survey area, densities and takes were only analyzed for the offshore stock.

Pilot whale density models from Duke University (Roberts et al. 2016a, 2016b, 2017) represent pilot whales as a 'guild' rather than by species. However, since the survey area is only expected to contain long-finned pilot whales, it is assumed that pilot whale densities modeled by Roberts et al. (2016a, 2016b, 2017) in the survey area only reflect the presence of long-finned pilot whales.

Recently, the Duke University density data have been updated with new modeling results, including updated NARW density data and density estimates for pinnipeds (Roberts *et al.,* 2016b, 2017, 2018, 2020). Updated density estimates for the NARW are due to the inclusion of three new datasets: 2011-2015 Northeast Large Pelagic Survey Cooperative, 2017-2018 Marine Mammal Surveys of the Wind Energy Areas conducted by the New England Aquarium, and 2017-2018 New York Bight Whale Monitoring Program surveys conducted by the New York State Department of Environmental conservation (NYSDEC). This new density data shows distribution changes that are likely influenced by oceanographic and prey covariates in the whale density model (Roberts *et al.,* 2021).

Pinniped density data (as presented in Roberts *et al.,* 2016b, 2017, 2018) were used to estimate pinniped densities within the identified survey area. Since pinniped

density models (Roberts *et al.*, 2016b, 2017, 2018) represent seals as a "guild" rather than by species, seal densities were apportioned for gray and harbor seals as 50% for each stock. These estimates were then applied to the average seasonal density values which were analyzed using the Roberts *et al.* (2018) data.

Seasonal marine mammal densities across survey areas are shown in Table 8. Maximum densities used in exposure analysis are shown in Table 9.

Table 8. Marine mammal seasonal densities across survey sites

Species	Averaged Seasonal Densities (Number of animals per 100 km^2)							
	Spring		Summer		Fall		Winter	
	Lease Area	ECR	Lease Area	ECR	Lease Area	ECR	Lease Area	ECR
North Atlantic right whale	0.386	0.475	0.003	0.003	0.011	0.012	0.273	0.373
Humpback whale	0.068	0.045	0.021	0.023	0.055	0.058	0.021	0.040
Fin whale	0.230	0.193	0.295	0.216	0.237	0.170	0.167	0.120
Sei whale	0.012	0.013	0.002	0.001	0.002	0.002	0.002	0.001
Minke whale	0.168	0.112	0.062	0.037	0.045	0.027	0.057	0.039
Sperm whale	0.003	0.003	0.030	0.042	0.021	0.023	0.002	0.001
Long-finned pilot whale	0.354	0.256	0.354	0.256	0.354	0.256	0.354	0.256
Bottlenose dolphin (offshore stock)	1.622	0.776	2.309	3.028	5.011	3.231	2.786	1.347
Common dolphin	7.017	3.326	6.138	3.753	7.235	6.611	19.246	13.251
Atlantic white-sided dolphin	2.213	1.611	0.972	0.802	0.855	0.726	1.461	0.890
Atlantic spotted dolphin	0.062	0.036	0.513	0.327	0.409	0.267	0.026	0.015

Risso's dolphin	0.012	0.005	0.089	0.038	0.024	0.012	0.032	0.015
Harbor porpoise	6.657	6.059	0.034	0.049	0.215	0.556	3.927	5.635
Harbor seal	3.544	5.799	0.052	0.077	0.055	0.109	3.262	5.479
Gray seal	3.544	5.799	0.052	0.077	0.055	0.109	3.262	5.479

Table 9. Maximum seasonal densities of marine mammals used in exposure analysis

Species	Maximum Seasonal Density Used (Number of animals per 100 km^2)	
	Lease Area	ECR Survey Area
North Atlantic right whale	0.386	0.475
Humpback whale	0.068	0.058
Fin whale	0.295	0.216
Sei whale	0.012	0.013
Minke whale	0.168	0.112
Sperm whale	0.030	0.042
Long-finned pilot whale	0.354	0.256
Bottlenose dolphin	5.011	3.231
Common dolphin	19.246	13.251
Atlantic white-sided dolphin	2.213	1.611
Atlantic spotted dolphin	0.062	0.036
Risso's dolphin	0.089	0.038

Harbor porpoise	6.657	6.059
Harbor seal	3.544	5.799
Gray seal	3.544	5.799

Take Estimation

Here we describe how the information provided above is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and proposed for authorization.

The number of marine mammals expected to be incidentally taken per day is calculated by estimating the number of each species predicted to occur within the daily ensonified area (animals/km^2), incorporating the maximum seasonal estimated marine mammal densities as described above. Estimated numbers of each species taken per day across all survey sites are then multiplied by the total number of survey days (*i.e.,* 360). The product is then rounded, to generate an estimate of the total number of instances of harassment expected for each species over the duration of the survey. A summary of this method is illustrated in the following formula with the resulting proposed take of marine mammals is shown below in Table 10:

Estimated Take = D × ZOI × # of days

Where:

D = average species density (per km^2); and

ZOI = maximum daily ensonified area to relevant thresholds.

Table 10. Total estimated and requested take numbers (by Level B harassment only)

Species	Calculated take estimate			

	Lease Area	ECR Survey Area	Combined take estimate	Total adjusted proposed take estimate*	Proposed percent of population to be taken
North Atlantic right whale	11	13	24	24	6.5
Humpback whale*	2	2	4	8	0.6
Fin whale	9	7	16	16	0.2
Sei whale^	0.3	0.4	0.7	2	0.03
Minke whale	5	3	8	8	0.04
Sperm whale	0.9	2	2.9	3	0.07
Long-finned pilot whale*	10	8	18	20	0.07
Bottlenose dolphin (Offshore stock)	141	91	232	232	0.4
Common dolphin	539	372	911	911	0.2
Atlantic white-sided dolphin	62	46	108	108	0.5
Atlantic spotted dolphin*	2	1	3	100	0.3
Risso's dolphin*	3	2	5	30	0.1
Harbor porpoise	187	170	357	357	0.4
Harbor seal	100	163	263	263	0.4
Gray seal	100	163	263	263	1.0

* Requested take adjusted for group size

^ Based upon previous IHAs

NMFS proposes to round decimal estimates to the nearest whole number in the event that a decimal was calculated for take. Therefore, take estimates for the sperm whale and sei whale were rounded up to three whales and two whales, respectively (Table 10). Requested take estimates were also adjusted to account for typical group sizes of humpback whale (King *et al.,* 2021), Risso's dolphin (NOAA 2022b), Atlantic spotted dolphin (Jefferson *et al.,* 2008), and long-finned pilot whale (NOAA 2022b). A total of 30 takes of Risso's dolphin, 100 takes of Atlantic spotted dolphin, and 20 takes of long-finned pilot whales are requested. Adding these additional takes ensures the number of takes authorized is at least equal to the average group size, and NMFS agrees with this approach.

Based on recent information from King *et al.* (2021) that demonstrated that the humpback whale is commonly sighted along the New York Bight area, NMFS determined that the humpback whale take request may be too low given the occurrence of animals near the survey area. Because of this, NMFS proposes to double the requested take to account for underestimates to the actual occurrence of this species within the density data.

Previously, 100 takes of Atlantic spotted dolphins, by Level B harassment, were authorized to Atlantic Shores during their 2020 IHA surveys (85 FR 7926; February 12, 2020). Early into the 2021 field season, Atlantic Shores observed large numbers of Atlantic spotted dolphins. A take of 100 Atlantic spotted dolphins was authorized for the Atlantic Shores 2022 IHA (87 FR 4200, January 27, 2022) to account for these numerous sightings. Based upon takes authorized for prior IHAs, NMFS proposes to adjust the take estimate, by Level B harassment, from 3 to 100 Atlantic spotted dolphins.

One sei whale take was calculated (Table 10), however, Atlantic Shores Bight has requested to increase sei whale takes to two whales. This increase is based on the average

group size of sei whales (NOAA 2022b). Therefore, NMFS proposes to adjust the take estimate, by Level B harassment, from 1 sei whale to 2 sei whales.

Proposed Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, and their habitat (50 CFR § 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, NMFS considers two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost and impact on operations.

NMFS proposes the following mitigation measures be implemented during Atlantic Shores Bight's planned marine site characterization surveys. Pursuant to section 7 of the ESA, Atlantic Shores Bight is also required to adhere to relevant Project Design Criteria (PDC) of the NMFS' Greater Atlantic Regional Fisheries Office (GARFO) programmatic consultation (specifically PDCs 4, 5, and 7) regarding geophysical surveys along the U.S. Atlantic coast (*https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic#offshore-wind-site-assessment-and-site-characterization-activities-programmatic-consultation*).

Marine Mammal Shutdown Zones

Marine mammal shutdown zones would be established around specified HRG survey equipment and monitored by protected species observers (PSOs). These PSOs will be NMFS-approved visual PSOs. Based upon the acoustic source in use (impulsive: Sparkers; non-impulsive: Non-parametric sub-bottom profilers), a minimum of one PSO must be on duty, per source vessel, during daylight hours and two PSOs must be on duty, per source vessel, during nighttime hours. These PSO will monitor shutdown zones based upon the radial distance from the acoustic source rather than being based around the vessel itself. The shutdown zone distances are as follows:

- A 500-m shutdown zone for North Atlantic right whales during use of specified acoustic sources (impulsive: Sparkers; non-impulsive: Non-parametric sub-bottom profilers).
- A 100-m shutdown zone for all other marine mammals (excluding NARWs and delphinids from the genera *Delphinus*, *Lagenorhynchus*, *Stenella*, or *Tursiops* that are visually detected as voluntarily approaching the vessel or towed equipment) during use of specified acoustic sources (as specified below). All visual monitoring must begin no less than 30

minutes prior to the initiation of the specified acoustic source and must continue until 30 minutes after use of specified acoustic sources ceases.

If a marine mammal is detected approaching or entering the shutdown zones during the HRG survey, the vessel operator would adhere to the shutdown procedures described below to minimize noise impacts on the animals. If a shutdown is required, a PSO will notify the survey crew immediately. Vessel operators and crews will comply immediately with any call for shutdown. Shutdown will remain in effect until the minimum separation distances (detailed above) between the animal and noise source are re-established. These stated requirements will be included in the site-specific training to be provided to the survey team.

Ramp up of Survey Equipment and Pre-Clearance of the Shutdown Zones

When technically feasible, a ramp-up procedure would be used for HRG survey equipment capable of adjusting energy levels at the start or restart of survey activities. A ramp-up would begin with the powering up of the smallest acoustic HRG equipment at its lowest practical power output appropriate for the survey. The ramp-up procedure would be used in order to provide additional protection to marine mammals near the survey area by allowing them to vacate the area prior to the commencement of survey equipment operation at full power. When technically feasible, the power would then be gradually turned up and other acoustic sources would be added. All ramp-ups shall be scheduled so as to minimize the time spent with the source being activated.

Ramp-up activities will be delayed if a marine mammal(s) enters its respective shutdown zone. Ramp-up will continue if the animal has been observed exiting its respective shutdown zone or until an additional time period has elapsed with no further sighting (*i.e.,* 15 minutes for small odontocetes and seals and 30 minutes for all other species).

Atlantic Shores Bight would implement a 30 minute pre-clearance period of the shutdown zones prior to the initiation of ramp-up of HRG equipment. The operator must notify a designated PSO of the planned start of ramp-up where the notification time should not be less than 60 minutes prior to the planned ramp-up. This would allow the PSOs to monitor the shutdown zones for 30 minutes prior to the initiation of ramp-up. Prior to ramp-up beginning, Atlantic Shores Bight must receive confirmation from the PSO that the shutdown zone is clear prior to proceeding. During this 30 minute pre-start clearance period, the entire applicable shutdown zones must be visible. The exception to this would be in situations where ramp-up may occur during periods of poor visibility (inclusive of nighttime) as long as appropriate visual monitoring has occurred with no detections of marine mammals in 30 minutes prior to the beginning of ramp-up. Acoustic source activation may only occur at night where operational planning cannot reasonably avoid such circumstances.

During this period, the shutdown zone will be monitored by the PSOs, using the appropriate visual technology. Ramp-up may not be initiated if any marine mammal(s) is within its respective shutdown zone. If a marine mammal is observed within a shutdown zone during the pre-clearance period, ramp-up may not begin until the animal(s) has been observed exiting its respective shutdown zone or until an additional time period has elapsed with no further sighting (*i.e.,* 15 minutes for small odontocetes and pinnipeds and 30 minutes for all other species). If a marine mammal enters the shutdown zone during ramp-up, ramp-up activities must cease and the source must be shut down. Any PSO on duty has the authority to delay the start of survey operations if a marine mammal is detected within the applicable pre-start clearance zones.

The pre-clearance zones would be:

- 500-m for all ESA-listed species (North Atlantic right, sei, fin, sperm whales); and

- 100-m for all other marine mammals.

If any marine mammal species that are listed under the ESA are observed within the clearance zones, the presence of the animal will be recorded and the 30 minute clock must be paused. If the PSO confirms the animal has exited the zone and headed away from the survey vessel, the 30 minute clock that was paused may resume. The pre-clearance clock will reset to 30 minutes if the animal dives or visual contact is otherwise lost.

If the acoustic source is shut down for brief periods (*i.e.,* less than 30 minutes) for reasons other than implementation of prescribed mitigation (*e.g.,* mechanical difficulty), the acoustic source may be reactivated without ramp-up if PSOs have maintained constant visual observation and no detection of marine mammals occurs within the applicable shutdown zone. For any longer shutdown, pre-start clearance observation and ramp-up are required.

Activation of survey equipment through ramp-up procedures may not occur when visual detection of marine mammals within the pre-clearance zone is not expected to be effective (*e.g.,* during inclement conditions such as heavy rain or fog).

The acoustic source(s) must be deactivated when not acquiring data or preparing to acquire data, except as necessary for testing. Unnecessary use of the acoustic source shall be avoided.

Shutdown Procedures

An immediate shutdown of the impulsive HRG survey equipment (Table 2) would be required if a marine mammal is sighted entering or within its respective shutdown zone(s). Any PSO on duty has the authority to call for a shutdown of the acoustic source if a marine mammal is detected within the applicable shutdown zones. Any disagreement between the PSO and vessel operator should be discussed only after shutdown has occurred. The vessel operator would establish and maintain clear lines of

communication directly between PSOs on duty and crew controlling the HRG source(s) to ensure that shutdown commands are conveyed swiftly while allowing PSOs to maintain watch.

The shutdown requirement is waived for small delphinids (belonging to the genera of the Family *Delphinidae: Delphinus, Lagenorhynchus, Stenella,* or *Tursiops*) and pinnipeds if they are visually detected within the applicable shutdown zones. If a species for which authorization has not been granted, or, a species for which authorization has been granted but the authorized number of takes have been met, approaches or is observed within the applicable Level B harassment zone, shutdown would occur. In the event of uncertainty regarding the identification of a marine mammal species (*i.e.,* such as whether the observed marine mammal belongs to *Delphinus, Lagenorhynchus, Stenella,* or *Tursiops* for which shutdown is waived, PSOs must use their best professional judgment in making the decision to call for a shutdown.

Specifically, if a delphinid from the specified genera or a pinniped is visually detected approaching the vessel (*i.e.,* to bow ride) or towed equipment, shutdown is not required.

Upon implementation of a shutdown, the source may be reactivated after the marine mammal has been observed exiting the applicable shutdown zone or following a clearance period of 15 minutes for harbor porpoises and 30 minutes for all other species where there are no further detections of the marine mammal.

Shutdown, pre-start clearance, and ramp-up procedures are not required during HRG survey operations using only non-impulsive sources (*e.g.,* parametric sub-bottom profilers) other than non-parametric sub-bottom profilers (*e.g.,* CHIRPs). Pre-clearance and ramp-up, but not shutdown, are required when using non-impulsive, non-parametric sub-bottom profilers.

Seasonal Operating Requirements

A section of the proposed survey area overlaps with approximately 2% of a North Atlantic right whale SMA. This SMA is active from November 1 through April 30 of each year. All survey vessels, regardless of length, would be required to adhere to vessel speed restrictions (<10 knots) when operating within the SMA during times when the SMA is active. In addition, between watch shifts, members of the monitoring team would consult NMFS' North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations. Members of the monitoring team would also monitor the NMFS North Atlantic right whale reporting systems for the establishment of Dynamic Management Areas (DMA). NMFS may also establish voluntary right whale Slow Zones any time a right whale (or whales) is acoustically detected. Atlantic Shores Bight should be aware of this possibility and remain attentive in the event a Slow Zone is established nearby or overlapping the survey area (Table 11).

Table 11. North Atlantic right whale dynamic management area (DMA) and seasonal management area (SMA) restrictions within Survey Area

Survey Area	Species	DMA Restrictions	Slow Zones	SMA Restrictions
Lease Area	North Atlantic Right Whale (*Eubalaena glacialis*)	If established by NMFS, all of Atlantic Shores Bight's vessels will abide by the described restrictions		N/A
ECR Survey Area				November 1- April 30 (ports of New York/New Jersey)

There are no known marine mammal rookeries or mating or calving grounds in the survey area that would otherwise potentially warrant increased mitigation measures for marine mammals or their habitat (or both). The proposed survey activities would occur in an area that has been identified as a biologically important area (BIA) for migration for North Atlantic right whales. However, given the small spatial extent of the

survey area relative to the substantially larger spatial extent of the right whale migratory area and the relatively low amount of noise generated by the survey, the survey is not expected to appreciably reduce the quality of migratory habitat nor to negatively impact the migration of North Atlantic right whales.

Vessel Strike Avoidance Procedures

Vessel operators must comply with the below measures except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question. These requirements do not apply in any case where compliance would create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of the restriction, cannot comply.

- A Vessel Strike Avoidance Zone(s) will be maintained, as defined as 1,640 ft (500 m) or greater from any sighted ESA-listed whale species or other unidentified large marine mammal;
    - If a large whale is identified within 1,640 ft (500 m) of the forward path of any vessel, the vessel operator must steer a course away from the whale at 10 knots (18.5 km/hr) or less until the 1,640 ft (500 m) minimum separation distance has been established. Vessels may also shift to idle if feasible.
    - If a large whale is sighted within 656 ft (200 m) of the forward path of a vessel, the vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 1,640 ft (500 m). If stationary, the vessel must not engage engines until the large whale has moved beyond 1,640 ft (500 m).

- All vessel operators and crew will maintain vigilant watch for all marine mammals, and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any marine mammals. Unless a required PSO is aboard and on duty, then a designated and trained vessel crew member on all vessels associated with survey activities (transiting [*i.e.,* traveling between a port and survey site] or actively surveying) will be assigned as a lookout for marine mammals;
- Members of the monitoring team will consult NMFS North Atlantic right whale reporting system and Whale Alert, daily and as able, for the presence of North Atlantic right whales throughout survey operations, and for the establishment of a DMA. If NMFS should establish a DMA in the survey area during the survey, the vessels will abide by speed restrictions in the DMA. All survey vessels, regardless of size, will observe a 10 knot (less than 18.5 km per hour [km/h]) speed restriction in the specific areas designated by NOAA Fisheries for the protection of NARWs from vessel strikes including seasonal management areas (SMAs), Right Whale Slow Zones, and dynamic management areas (DMAs), when in effect. See *www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-ship-strikes-north-atlantic-right-whales* for specific detail regarding these areas.
- All vessels greater than or equal to 65 ft (19.8 m) in overall length operating from November 1 through April 30 will operate at speeds of 10 knots or less while transiting to and from the survey area.
- All vessels, regardless of size, will reduce vessel speed to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near (within 330 ft [100 m]) of an underway vessel.

- All vessels will, to the maximum extent practicable, attempt to maintain a minimum separation distance of 164 ft (50 m) from all other marine mammals than ESA-listed and large whales, with an understanding that at times this may not be possible (*e.g.,* for animals that approach the vessel).
- When marine mammals are sighted while a vessel is underway, the vessel will take action as necessary to avoid violating the relevant separation distance (*e.g.,* attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). Engines will not be engaged until the animals are clear of the area. This will not apply to any vessel towing gear or any vessel that is navigationally constrained.

Training

All PSOs must have completed a PSO training program and received NMFS approval to act as a PSO for geophysical surveys. Documentation of NMFS approval and most recent training certificates of individual PSOs' successful completion of a commercial PSO training course must be provided upon request. Further information can be found at *www.fisheries.noaa.gov/national/endangered-species-conservation/ protected-species-observers.* In the event where third-party PSOs are not required, crew members serving as lookouts must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements.

Atlantic Shores Bight shall instruct relevant vessel personnel with regard to the authority of the marine mammal monitoring team, and shall ensure that relevant vessel personnel and the marine mammal monitoring team participate in a joint onboard briefing (hereafter PSO briefing), led by the vessel operator and lead PSO, prior to beginning

survey activities to ensure that responsibilities, communication procedures, marine mammal monitoring protocols, safety and operational procedures, and IHA requirements are clearly understood. This PSO briefing must be repeated when relevant new personnel (*e.g.,* PSOs, acoustic source operator) join the survey operations before their responsibilities and work commences.

Project-specific training will be conducted for all vessel crew prior to the start of a survey and during any changes in crew such that all survey personnel are fully aware and understand the mitigation, monitoring, and reporting requirements. All vessel crew members must be briefed in the identification of protected species that may occur in the survey area and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all project vessels for identification of listed species. The expectation and process for reporting of protected species sighted during surveys must be clearly communicated and posted in highly visible locations aboard all project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so. Prior to implementation with vessel crews, the training program will be provided to NMFS for review and approval. Confirmation of the training and understanding of the requirements will be documented on a training course log sheet. Signing the log sheet will certify that the crew member understands and will comply with the necessary requirements throughout the survey activities.

Based on our evaluation of the applicant's proposed measures, NMFS has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;

- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and,
- Mitigation and monitoring effectiveness.

Proposed Monitoring Measures

Atlantic Shores Bight must use independent, dedicated, trained PSOs, meaning that the PSOs must be employed by a third-party observer provider, must have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammal and mitigation requirements (including brief alerts regarding maritime hazards), and must have successfully completed an approved PSO training course for geophysical surveys. Visual monitoring must be performed by qualified, NMFS-approved PSOs. PSO resumes must be provided to NMFS for review and approval prior to the start of survey activities.

PSO names must be provided to NMFS by the operator for review and confirmation of their approval for specific roles prior to commencement of the survey. For prospective PSOs not previously approved, or for PSOs whose approval is not current, NMFS must review and approve PSO qualifications. Resumes should include information related to relevant education, experience, and training, including dates, duration, location, and description of prior PSO experience. Resumes must be accompanied by relevant documentation of successful completion of necessary training.

NMFS may approve PSOs as conditional or unconditional. A conditionally-approved PSO may be one who is trained but has not yet attained the requisite experience. An unconditionally-approved PSO is one who has attained the necessary experience. For unconditional approval, the PSO must have a minimum of 90 days at sea performing the role during a geophysical survey, with the conclusion of the most recent relevant experience not more than 18 months previous.

At least one of the visual PSOs aboard the vessel must be unconditionally-approved. One unconditionally-approved visual PSO shall be designated as the lead for the entire PSO team. This lead should typically be the PSO with the most experience, would coordinate duty schedules and roles for the PSO team, and serve as primary point of contact for the vessel operator. To the maximum extent practicable, the duty schedule shall be planned such that unconditionally-approved PSOs are on duty with conditionally-approved PSOs.

PSOs must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences, a minimum of 30 semester hours or equivalent in the biological sciences, and at least one undergraduate course in math or statistics. The educational requirements may be waived if the PSO has acquired the relevant skills through alternate experience. Requests for such a waiver shall be submitted to NMFS and must include written justification. Alternate experience that may be considered includes, but is not limited to (1) secondary education and/or experience comparable to PSO duties; (2) previous work experience conducting academic, commercial, or government-sponsored marine mammal surveys; and (3) previous work experience as a PSO (PSO must be in good standing and demonstrate good performance of PSO duties).

PSOs must successfully complete relevant training, including completion of all required coursework and passing (80 percent or greater) a written and/or oral examination developed for the training program.

PSOs must coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts and shall conduct visual observations using binoculars or night-vision equipment and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.

PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least two hours between watches and may conduct a maximum of 12 hours of observation per 24-hour period.

Any observations of marine mammal by crew members aboard any vessel associated with the survey shall be relayed to the PSO team.

Atlantic Shores Bight must work with the selected third-party PSO provider to ensure PSOs have all equipment (including backup equipment) needed to adequately perform necessary tasks, including accurate determination of distance and bearing to observed marine mammals, and to ensure that PSOs are capable of calibrating equipment as necessary for accurate distance estimates and species identification. Such equipment, at a minimum, shall include:

- At least one thermal (infrared) imagine device suited for the marine environment;
- Reticle binoculars (*e.g.,* 7 × 50) of appropriate quality (at least one per PSO, plus backups);
- Global Positioning Units (GPS) (at least one plus backups);
- Digital cameras with a telephoto lens that is at least 300-mm or equivalent on a full-frame single lens reflex (SLR) (at least one plus backups). The camera or lens should also have an image stabilization system;
- Equipment necessary for accurate measurement of distances to marine mammal;
- Compasses (at least one plus backups);
- Means of communication among vessel crew and PSOs; and
- Any other tools deemed necessary to adequately and effectively perform PSO tasks.

The equipment specified above may be provided by an individual PSO, the third-part PSO provider, or the operator, but Atlantic Shores Bight is responsible for ensuring PSOs have the proper equipment required to perform the duties specified in the IHA.

During good conditions (*e.g.,* daylight hours; Beaufort sea state 3 or less), PSOs shall conduct observations when the specified acoustic sources are not operating for comparison of sighting rates and behavior with and without use of the specified acoustic sources and between acquisition periods, to the maximum extent practicable.

The PSOs will be responsible for monitoring the waters surrounding each survey vessel to the farthest extent permitted by sighting conditions, including shutdown zones, during all HRG survey operations. PSOs will visually monitor and identify shutdown zones during survey activities. It will be the responsibility of the PSO(s) on duty to communicate the presence of marine mammals as well as to communicate the action(s) that are necessary to ensure mitigation and monitoring requirements are implemented as appropriate.

In cases when pre-clearance has begun in conditions with good visibility, including via the use of night-vision equipment, and the lead PSO has determined that the pre-start clearance zones are clear of marine mammals, survey operations may commence (*i.e.,* no delay is required) despite brief periods of inclement weather and/or loss of daylight.

Atlantic Shores Bight plans to utilize six PSOs across each vessel to account for shift changes, with a total of 18 during this project (six PSOs per vessel x three vessels). At a minimum, during all HRG survey operations (*e.g.,* any day on which use of an HRG source is planned to occur), one PSO must be on duty during daylight operations on each survey vessel, conducting visual observations at all times on all active survey vessels during daylight hours (*i.e.,* from 30 minutes prior to sunrise through 30 minutes following sunset) and two PSOs will be on watch during nighttime operations. The PSO(s) would ensure 360° visual coverage around the vessel from the most appropriate observation posts and would conduct visual observations using binoculars and/or night vision goggles and the naked eye while free from distractions and in a consistent, systematic, and

diligent manner. PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least two hours between watches and may conduct a maximum of 12 hours of observation per 24-hr period. In cases where multiple vessels are surveying concurrently, any observations of marine mammals would be communicated to PSOs on all nearby survey vessels.

PSOs must be equipped with binoculars and have the ability to estimate distance and bearing to detect marine mammals, particularly in proximity to Exclusion Zones. Reticulated binoculars must also be available to PSOs for use as appropriate based on conditions and visibility to support the sighting and monitoring of marine mammals. During nighttime operations, night-vision goggles with thermal clip-ons and infrared technology would be used. Position data would be recorded using hand-held or vessel GPS units for each sighting.

During good conditions (*e.g.,* daylight hours; Beaufort sea state (BSS) 3 or less), to the maximum extent practicable, PSOs would also conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the active acoustic sources. Any observations of marine mammals by crew members aboard any vessel associated with the survey would be relayed to the PSO team. Data on all PSO observations would be recorded based on standard PSO collection requirements (see *Proposed Reporting Measures*). This would include dates, times, and locations of survey operations; dates and times of observations, location and weather; details of marine mammal sightings (*e.g.,* species, numbers, behavior); and details of any observed marine mammal behavior that occurs (*e.g.,* noted behavioral disturbances).

Proposed Reporting Measures

Atlantic Shores Bight shall submit a draft comprehensive report on all activities and monitoring results within 90 days of the completion of the survey or expiration of the IHA, whichever comes sooner. The report must describe all activities conducted and

sightings of marine mammals, must provide full documentation of methods, results, and interpretation pertaining to all monitoring, and must summarize the dates and locations of survey operations and all marine mammals sightings (dates, times, locations, activities, associated survey activities). The draft report shall also include geo-referenced, time-stamped vessel tracklines for all time periods during which acoustic sources were operating. Tracklines should include points recording any change in acoustic source status (*e.g.,* when the sources began operating, when they were turned off, or when they changed operational status such as from full array to single gun or vice versa). GIS files shall be provided in ESRI shapefile format and include the UTC date and time, latitude in decimal degrees, and longitude in decimal degrees. All coordinates shall be referenced to the WGS84 geographic coordinate system. In addition to the report, all raw observational data shall be made available. The report must summarize the information submitted in interim monthly reports (if required) as well as additional data collected. A final report must be submitted within 30 days following resolution of any comments on the draft report. All draft and final marine mammal reports must be submitted to *PR.ITP.MonitoringReports@noaa.gov*, *ITP.Taylor@noaa.gov,* and *nmfs.gar.incidental-take@noaa.gov.*

PSOs must use standardized electronic data forms to record data. PSOs shall record detailed information about any implementation of mitigation requirements, including the distance of marine mammal to the acoustic source and description of specific actions that ensued, the behavior of the animal(s), any observed changes in behavior before and after implementation of mitigation, and if shutdown was implemented, the length of time before any subsequent ramp-up of the acoustic source. If required mitigation was not implemented, PSOs should record a description of the circumstances.

At a minimum, the following information must be recorded:

1. Vessel names (source vessel and other vessels associated with survey), vessel size and type, maximum speed capability of vessel;

2. Dates of departures and returns to port with port name;

3. The lease number;

4. PSO names and affiliations;

5. Date and participants of PSO briefings;

6. Visual monitoring equipment used;

7. PSO location on vessel and height of observation location above water surface;

8. Dates and times (Greenwich Mean Time) of survey on/off effort and times corresponding with PSO on/off effort;

9. Vessel location (decimal degrees) when survey effort begins and ends and vessel location at beginning and end of visual PSO duty shifts;

10. Vessel location at 30-second intervals if obtainable from data collection software, otherwise at practical regular interval

11. Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any change;

12. Water depth (if obtainable from data collection software);

13. Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including BSS and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon;

14. Factors that may contribute to impaired observations during each PSO shift change or as needed as environmental conditions change (*e.g.,* vessel traffic, equipment malfunctions); and

15. Survey activity information (and changes thereof), such as acoustic source power output while in operation, number and volume of airguns operating in an array, tow depth

of an acoustic source, and any other notes of significance (*i.e.,* pre-start clearance, ramp-up, shutdown, testing, shooting, ramp-up completion, end of operations, streamers, etc.).

Upon visual observation of any marine mammal, the following information must be recorded:

1. Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);

2. Vessel/survey activity at time of sighting (*e.g.,* deploying, recovering, testing, shooting, data acquisition, other);

3. PSO who sighted the animal;

4. Time of sighting;

5. Initial detection method;

6. Sightings cue;

7. Vessel location at time of sighting (decimal degrees);

8. Direction of vessel's travel (compass direction);

9. Speed of the vessel(s) from which the observation was made;

10. Identification of the animal (*e.g.,* genus/species, lowest possible taxonomic level or unidentified); also note the composition of the group if there is a mix of species;

11. Species reliability (an indicator of confidence in identification);

12. Estimated distance to the animal and method of estimating distance;

13. Estimated number of animals (high/low/best);

14. Estimated number of animals by cohort (adults, yearlings, juveniles, calves, group composition, etc.);

15. Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars, or markings, shape and size of dorsal fin, shape of head, and blow characteristics);

16. Detailed behavior observations (*e.g.,* number of blows/breaths, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior before and after point of closest approach);

17. Mitigation actions; description of any actions implemented in response to the sighting (*e.g.,* delays, shutdowns, ramp-up, speed or course alteration, etc.) and time and location of the action;

18. Equipment operating during sighting;

19. Animal's closest point of approach and/or closest distance from the center point of the acoustic source; and

20. Description of any actions implemented in response to the sighting (*e.g.,* delays, shutdown, ramp-up) and time and location of the action.

If a North Atlantic right whale is observed at any time by PSOs or personnel on any project vessels, during surveys or during vessel transit, Atlantic Shores Bight must report the sighting information to the NMFS North Atlantic Right Whale Sighting Advisory System (866-755-6622) within two hours of occurrence, when practicable, or no later than 24 hours after occurrence. North Atlantic right whale sightings in any location may also be reported to the U.S. Coast Guard via channel 16 and through the WhaleAlert app (*http://www.whalealert.org*).

In the event that Atlantic Shores Bight personnel discover an injured or dead marine mammal, regardless of the cause of injury or death, Atlantic Shores Bight must report the incident to NMFS as soon as feasible by phone (866-755-6622) and by email (*nmfs.gar.stranding@noaa.gov* and *PR.ITP.MonitoringReports@noaa.gov*) as soon as feasible. The report must include the following information:

1. Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);

2. Species identification (if known) or description of the animal(s) involved;

3. Condition of the animal(s) (including carcass condition if the animal is dead);

4. Observed behaviors of the animal(s), if alive;

5. If available, photographs or video footage of the animal(s); and

6. General circumstances under which the animal was discovered.

In the unanticipated event of a ship strike of a marine mammal by any vessel involved in the activities covered by the IHA, Atlantic Shores Bight must report the incident to NMFS by phone (866-755-6622) and by email (*nmfs.gar.stranding@noaa.gov* and *PR.ITP.MonitoringReports@noaa.gov*) as soon as feasible. The report would include the following information:

1. Time, date, and location (latitude/longitude) of the incident;

2. Species identification (if known) or description of the animal(s) involved;

3. Vessel's speed during and leading up to the incident;

4. Vessel's course/heading and what operations were being conducted (if applicable);

5. Status of all sound sources in use;

6. Description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike;

7. Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, visibility) immediately preceding the strike;

8. Estimated size and length of animal that was struck;

9. Description of the behavior of the marine mammal immediately preceding and/or following the strike;

10. If available, description of the presence and behavior of any other marine mammals immediately preceding the strike;

11. Estimated fate of the animal (*e.g.,* dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and

12. To the extent practicable, photographs or video footage of the animal(s).

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, the discussion of our analysis applies to all the species listed in Table 3, given that the anticipated effects of this activity on these different marine mammal stocks are expected to be similar. Where there are meaningful differences between species or stocks—as is the case of the North Atlantic right whale—they are included as separate subsections below. NMFS does not anticipate that serious injury or mortality would occur as a result from HRG surveys, even in the absence of mitigation, and no serious injury or mortality is proposed to be authorized. As discussed in the

Potential Effects section, non-auditory physical effects and vessel strike are not expected to occur. NMFS expects that all potential takes would be in the form of short-term Level B behavioral harassment in the form of temporary avoidance of the area or decreased foraging (if such activity was occurring), reactions that are considered to be of low severity and with no lasting biological consequences (*e.g.,* Southall *et al.,* 2007). Even repeated Level B harassment of some small subset of an overall stock is unlikely to result in any significant realized decrease in viability for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. As described above, Level A harassment is not expected to occur given the nature of the operations, the estimated size of the Level A harassment zones, and the required shutdown zones for certain activities.

In addition to HRG activities being temporary, the maximum expected harassment zone around a survey vessel is 141 m. Although this distance is assumed for all survey activity in estimating take numbers proposed for authorization and evaluated here, in reality, the Applied Acoustics Dura-Spark 240 would likely not be used across the entire 24-hour period and across all 360 days. As noted in Table 6, the other acoustic sources Atlantic Shores Bight has included in their application produce Level B harassment zones below 60-m. Therefore, the ensonified area surrounding each vessel is relatively small compared to the overall distribution of the animals in the area and their habitat.

Feeding behavior is not likely to be significantly impacted as prey species are mobile and are broadly distributed throughout the survey area; therefore, marine mammals that may be temporarily displaced during survey activities are expected to be able to resume foraging once they have moved away from areas with disturbing levels of underwater noise. Due to the temporary nature of the disturbance and the availability of similar habitat and resources in the surrounding area, the impacts to marine mammals and

the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or their populations.

There are no known mating or calving grounds nor feeding areas known to be biologically important to marine mammals within the proposed survey area. There is no designated critical habitat for any ESA-listed marine mammals in the proposed survey area.

North Atlantic Right Whales

The status of the North Atlantic right whale population is of heightened concern and, therefore, merits additional analysis. As noted previously, elevated North Atlantic right whale mortalities began in June 2017 and there is an active UME. Overall, preliminary findings support human interactions, specifically vessel strikes and entanglements, as the cause of death for the majority of right whales. As noted previously, the proposed survey area overlaps a migratory corridor BIA for North Atlantic right whales. Due to the fact that the proposed survey activities are temporary and the spatial extent of sound produced by the survey would be very small relative to the spatial extent of the available migratory habitat in the BIA, right whale migration is not expected to be impacted by the proposed survey activities. Required vessel strike avoidance measures will also decrease risk of ship strike during migration; no ship strike is expected to occur during Atlantic Shores Bight's proposed activities. The 500-m shutdown zone for right whales is conservative, considering the Level B harassment isopleth for the most impactful acoustic source (*i.e.,* sparker) is estimated to be 141-m, and thereby minimizes the potential for behavioral harassment of this species.

As noted previously, Level A harassment is not expected due to the small PTS zones associated with HRG equipment types proposed for use. The proposed authorizations for Level B harassment takes of North Atlantic right whale are not expected to exacerbate or compound upon the ongoing UME. The limited North Atlantic

right whale Level B harassment takes proposed for authorization are expected to be of a short duration, and given the number of estimated takes, repeated exposures of the same individual are not expected. Further, given the relatively small size of the ensonified area during Atlantic Shores Bight's proposed activities, it is unlikely that North Atlantic right whale prey availability would be adversely affected. Accordingly, NMFS does not anticipate that any North Atlantic right whales takes resulting from Atlantic Shores Bight's proposed activities would impact annual rates of recruitment or survival. Thus, any takes that occur would not result in population level impacts.

Other Marine Mammal Species with Active UMEs

As noted previously, there are several active UMEs occurring in the vicinity of Atlantic Shores Bight's proposed survey area. Elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida since January 2016. Of the cases examined, approximately half had evidence of human interaction (ship strike or entanglement). The UME does not yet provide cause for concern regarding population-level impacts. Despite the UME, the relevant population of humpback whales (the West Indies breeding population, or DPS) remains stable at approximately 12,000 individuals.

Beginning in January 2017, elevated minke whale strandings have occurred along the Atlantic coast from Maine through South Carolina, with highest numbers in Massachusetts, Maine, and New York. This event does not provide cause for concern regarding population level impacts, as the likely population abundance is greater than 20,000 whales.

The required mitigation measures are expected to reduce the number and/or severity of proposed takes for all species listed in Table 3, including those with active UMEs, to the level of least practicable adverse impact. In particular, they would provide animals the opportunity to move away from the sound source throughout the survey area before HRG survey equipment reaches full energy, thus preventing them from being

exposed to sound levels that have the potential to cause injury (Level A harassment) or more severe Level B harassment. As discussed previously, take by Level A harassment (injury) is considered unlikely, even absent mitigation, based on the characteristics of the signals produced by the acoustic sources planned for use, and is not proposed for authorization. Implementation of required mitigation would further reduce this potential. Therefore, NMFS is not proposing any Level A harassment for authorization.

NMFS expects that takes would be in the form of short-term Level B behavioral harassment by way of brief startling reactions, temporarily vacating the area, or decreased foraging (if such activity was occurring)—reactions that (at the scale and intensity anticipated here) are considered to be of low severity, with no lasting biological consequences. Since both the sources and marine mammals are mobile, animals would only be exposed briefly to a small ensonified area that might result in take. Additionally, required mitigation measures would further reduce exposure to sound that could result in more severe behavioral harassment.

Biologically Important Areas for Other Species

As previously discussed, impacts from the proposed project are expected to be localized to the specific area of activity and only during periods of time where Atlantic Shores Bight's acoustic sources are active. While BIAs for feeding for fin and humpback whales as well as haul out sites for harbor seals can be found off the coast of New Jersey and New York, NMFS does not expect this proposed action to affect these areas. This is due to the combination of the mitigation and monitoring measures being required of Atlantic Shores Bight as well as the location of these biologically important areas. All of these important areas are found outside of the range of this survey area, as is the case with fin whales and humpback whales (BIAs found further north), and, therefore, not expected to be impacted by Atlantic Shores Bight's proposed survey activities.

Three major haul-out sites exist for harbor seals, inshore of the ECR Survey Area along New Jersey, at Great Bay, Sand Hook, and Barnegat Inlet (CWFNJ, 2015). As hauled outs are inshore and seals would be out of the water, no in-water effects are expected.

Preliminary Determinations

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect any of the species or stocks through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or authorized;
- No Level A harassment (PTS) is anticipated, even in the absence of mitigation measures, or proposed for authorization;
- Foraging success is not likely to be impacted as effects on prey species for marine mammals from the proposed activities are expected to be minimal;
- Alternate areas of similar habitat value are available for marine mammals to temporarily vacate the survey area during the planned activities to avoid exposure to sounds generated by surveys;
- Take is anticipated to be by Level B behavioral harassment only consisting of brief startling reactions and/or temporary avoidance of the survey area;
- While the survey area is within a noted migratory BIA for North Atlantic right whales, the activities would occur in such a comparatively small area such that any avoidance of the survey area due to activities would not affect migration; and
- The proposed mitigation measures, including effective visual monitoring, and shutdowns are expected to minimize potential impacts to marine mammals.

Based on the analysis contained herein of the likely effects of the specified activities on marine mammals and their habitat, and taking into consideration the

implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

NMFS proposes to authorize incidental take (by Level B harassment only) of 15 marine mammal species (with 15 managed stocks). The total amount of takes proposed for authorization relative to the best available population abundance is less than 7 percent for all stocks (Table 11). Therefore, NMFS preliminarily finds that small numbers of marine mammals may be taken relative to the estimated overall population abundances for those stocks.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals would be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

Section 7(a)(2) of the ESA: 16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally whenever we propose to authorize take for endangered or threatened species, in this case with the Greater Atlantic Regional Fisheries Office.

NMFS OPR is proposing to authorize the incidental take of four species of marine mammals which are listed under the ESA, including the North Atlantic right, fin, sei, and sperm whale, and has determined that this activity falls within the scope of activities analyzed in NMFS GARFO's programmatic consultation regarding geophysical surveys along the U.S. Atlantic coast in the three Atlantic Renewable Energy Regions (completed June 29, 2021; revised September 2021).

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to Atlantic Shores Bight for conducting site characterization surveys off New Jersey and New York from August 1, 2022 through July 31, 2023, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities*.-

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this notice of proposed IHA for the proposed site characterization surveys. We also request comment on the potential renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for this IHA or a subsequent renewal IHA.

On a case-by-case basis, NMFS may issue a one-time, one-year renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical activities as described in the **Description of Proposed Activities** section of this notice is planned or (2) the activities as described in the **Description of Proposed Activities** section of this notice would not be completed by the time the IHA expires and a renewal would allow for completion of the activities beyond that described in the *Dates and Duration* section of this notice, provided all of the following conditions are met:

- A request for renewal is received no later than 60 days prior to the needed renewal IHA effective date (recognizing that the renewal IHA expiration date cannot extend beyond one year from expiration of the initial IHA).
- The request for renewal must include the following:

(1) An explanation that the activities to be conducted under the requested renewal IHA are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take).

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: June 22, 2022.

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Kimberly Damon-Randall,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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